THE CROSSLEY MACHINE CO.
TRENTON, N.J., U.S.A.
"DURABILITY - STRENGTH - ECONOMY"
WHEN QUALITY IS CONSIDERED
CROSSLEY
MACHINERY IS CHEAPEST
MFRS. OF
CLAY WORKING MACHINERY

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1918

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Crossley Machinery

COPYRIGHT, 1918
THE CROSSLEY MACHINE CO.

ALL of the machines in this catalogue, with few exceptions, are protected by U. S. and Foreign Patents, and we will go to the full extent of the law to protect our rights.

ESTABLISHED 1879 INCORPORATED 1896

The
Crossley Machine Co.
(Incorporated)

MANUFACTURERS OF

CLAY WORKING MACHINERY

Pottery
Electric Porcelain, Tile Making
Clay Washing and Crucible
Machinery

◆

Machinery for Grinding, Mixing, Washing and Forming Clay, Flint, Spar, Plumbago, Refractory Substances and Materials of like nature.

◆

We are Engineers to the Clay Worker

◆

Main Office and Works:
Trenton, New Jersey, U. S. A.

TERMS

Our terms are cash in thirty days, unless by special agreement.

Prices given for immediate acceptance, and subject to change without notice.

Time of delivery is always subject to detentions, over which we have no control.

We are not responsible for condition of goods after shipment. Delivery in good order to railroad or steamship company is considered as delivery to purchaser.

Unless otherwise specified, delivery is F. O. B. Trenton, N. J.

Boxing and cartage, when necessary, will be added to bill at cost price.

We reserve the privilege of altering details of machines illustrated when our experience deems it necessary.

All quotations, contracts and sales are made without liability on our part for delays arising from strikes, accidents or other causes beyond our control.

Owing to the fact that different kinds of materials require different methods for working, and that we are constantly making changes in the way of improvements in our machinery, we find it impossible to give accurate data regarding the various machines illustrated in this catalogue; we would, therefore, recommend that our customers, in ordering machinery, would ask us for information as required.

INTRODUCTION

In the following pages we have illustrated a few of our machines of most recent design. In addition to those shown, we build a great number of others, and we shall be pleased to furnish photographs or prints for any requirement upon request.

We make a special feature of designing and constructing machines to suit any particular work that our customers may desire.

Our works, shown on the following page of this catalogue, are situated in Trenton, N. J., U. S. A., on the main line of the New York Division of the Pennsylvania Railroad.

We shall be pleased to quote upon any of our standard machines or upon special machinery.

In presenting this catalogue, descriptive of **Clay Working Machinery,** of which we make an exclusive specialty, we wish to call your attention to the many improvements which have been made, also the several different styles and sizes of machinery added to our line since our last issue. We guarantee all the machines herein described as represented, and to substantiate what we say, we refer you to our numerous satisfied customers. We do not claim perfection, neither have we been able to find any honest manufacturer that does. We simply say that our machinery is second to none, and have a place in the front rank in our line. Each and every machine is carefully tested before it leaves our works. We would also state that the majority of the machines in this catalogue are protected by patents, and we therefore warn imitators. Parts of any machine can be furnished promptly.

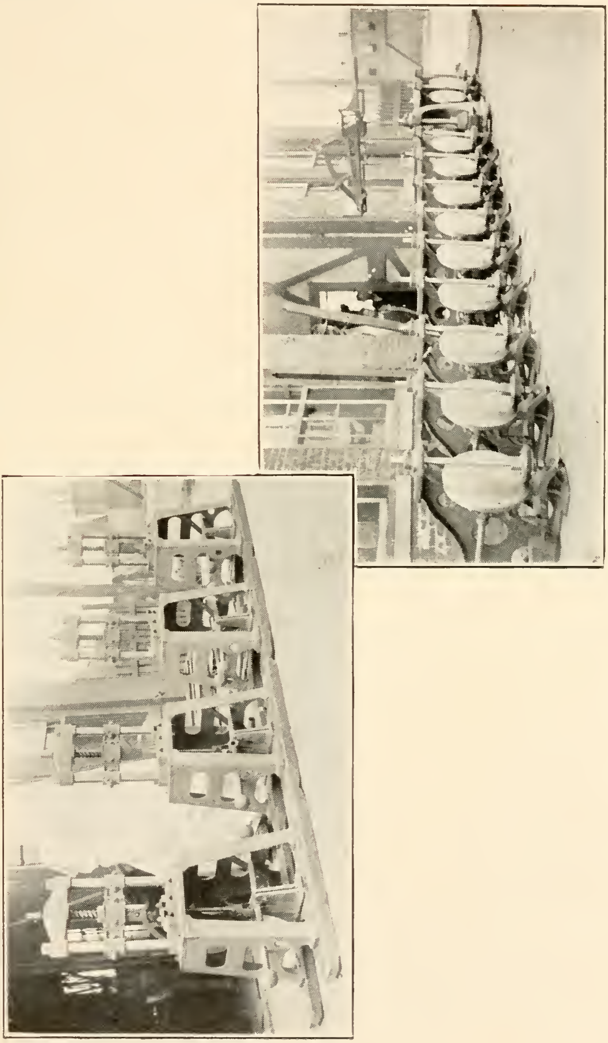
Prices, Weights and Full Specifications

will be promptly furnished to intending purchasers, together with data on anything in our line not found in this book.

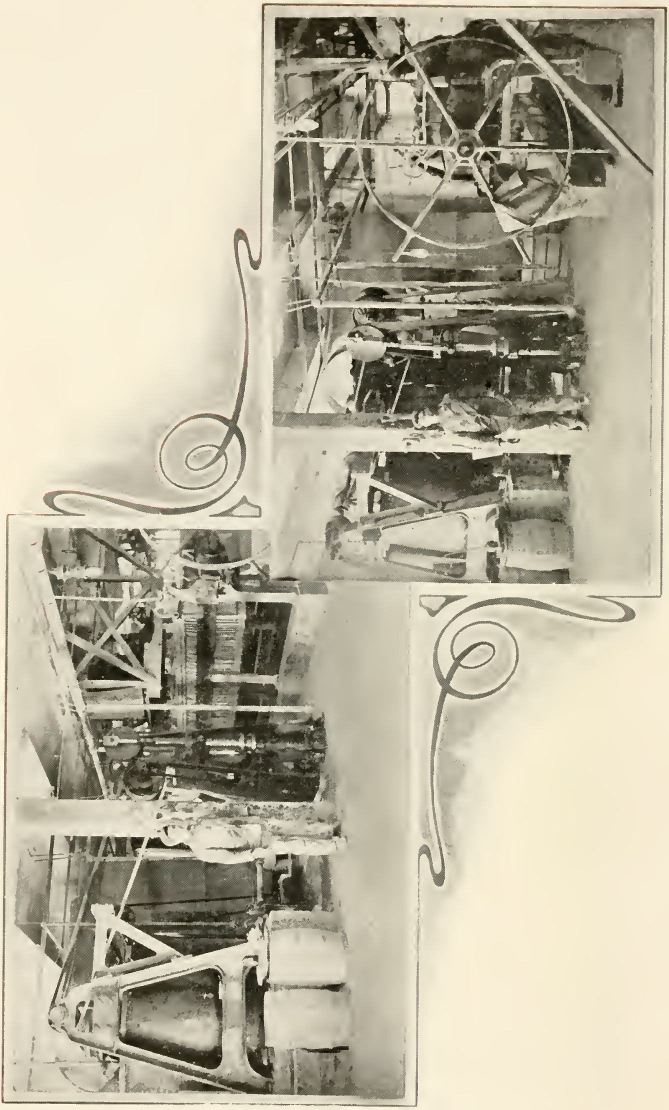
THE CROSSLEY MANUFACTURING COMPANY MFRS OF POTTERY & TILE MACHINERY

MEMBER THE NATIONAL ASSOCIATION OF MANUFACTURERS

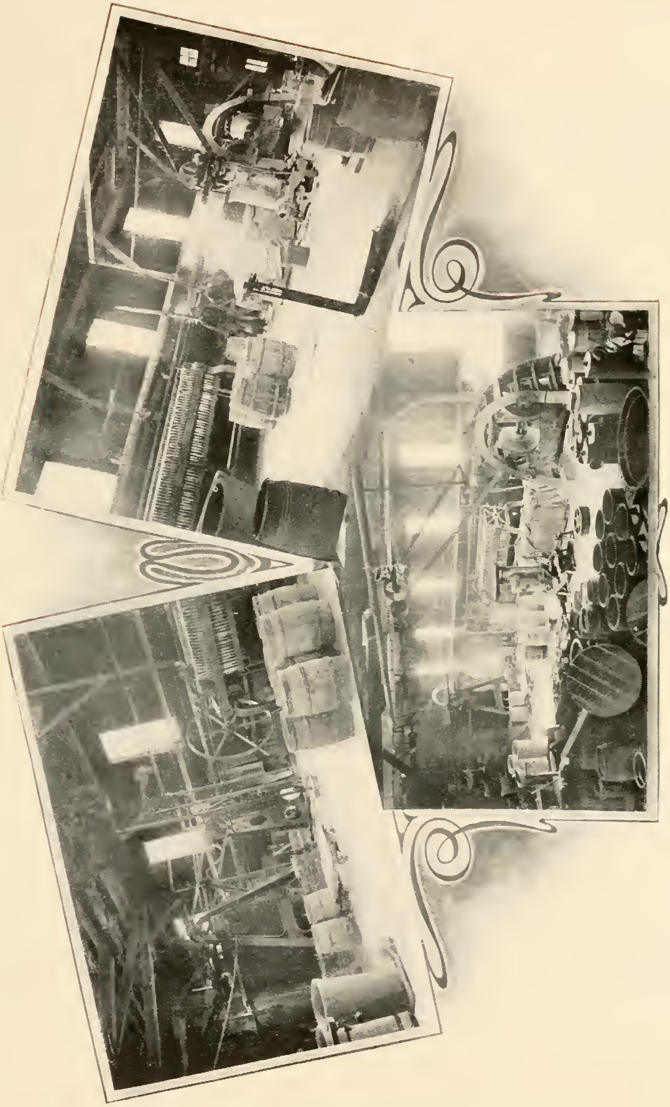
Complete Equipments—"Crossley Process"



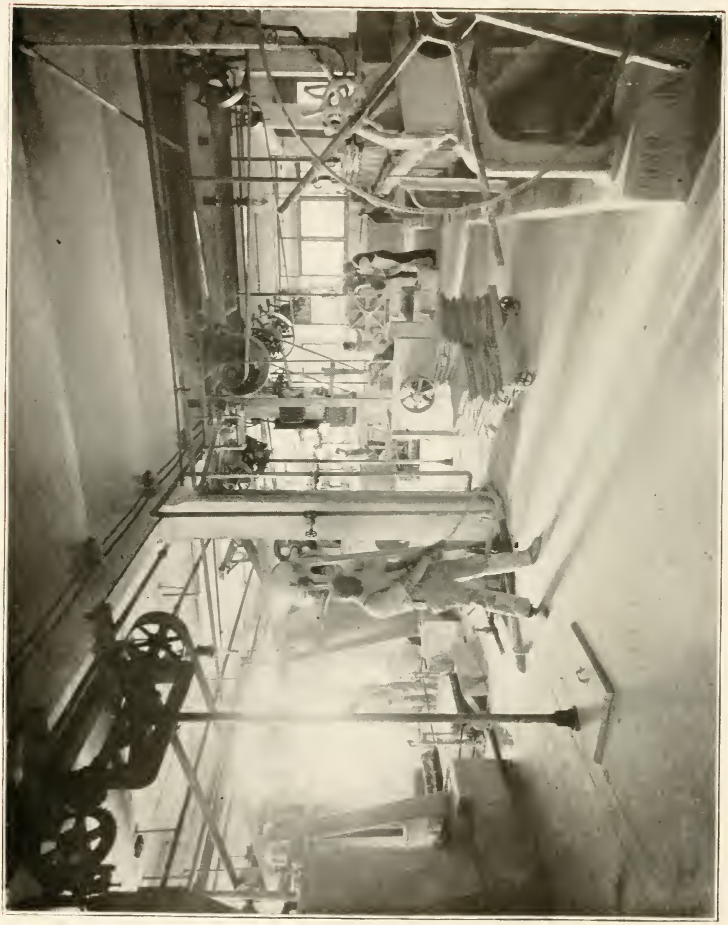
WE EQUIP CLAY WORKING PLANTS COMPLETE READY FOR OPERATION



CLAY MIXING DEPARTMENT OF
CONKLING-ARMSTRONG TERRA COTTA CO., PHILADELPHIA, PA.



CLAY DEPARTMENT OF
THE GENERAL CHEMICAL COMPANY, CAMDEN, N. J.



SLIP-HOUSE, BUFFALO POTTERY COMPANY, BUFFALO, N. Y.

Clay Washing and Refining Plants

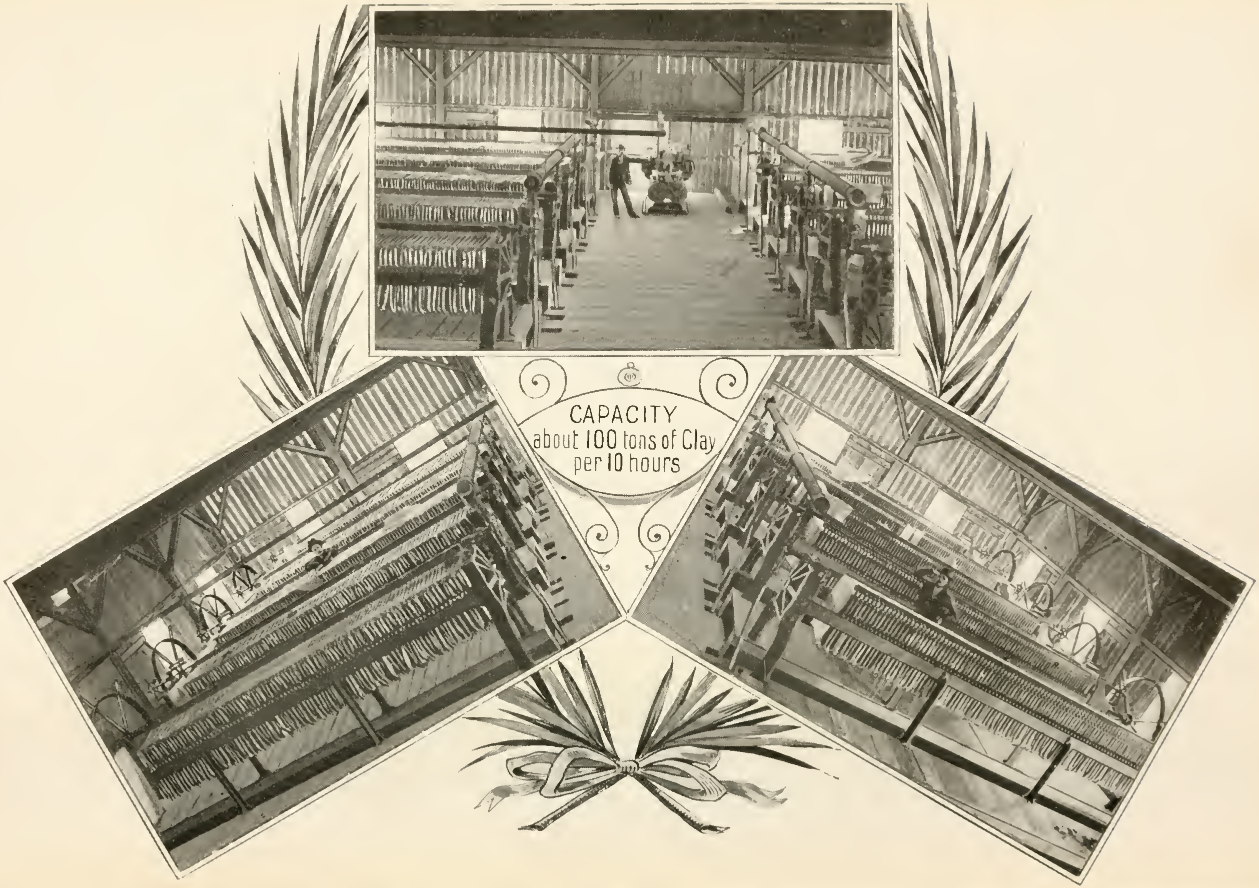
In preparing clay for the market, the process is altogether dependent upon the nature of the clay and the impurities to be extracted. It is, therefore, necessary to find some means for extracting these impurities, and it is for this purpose that we have made a special study of this branch of the clay industry, and we feel quite capable of tackling any problem along this line.

We are now manufacturing a line of machinery that we are sure will meet the requirements of the clay miner.

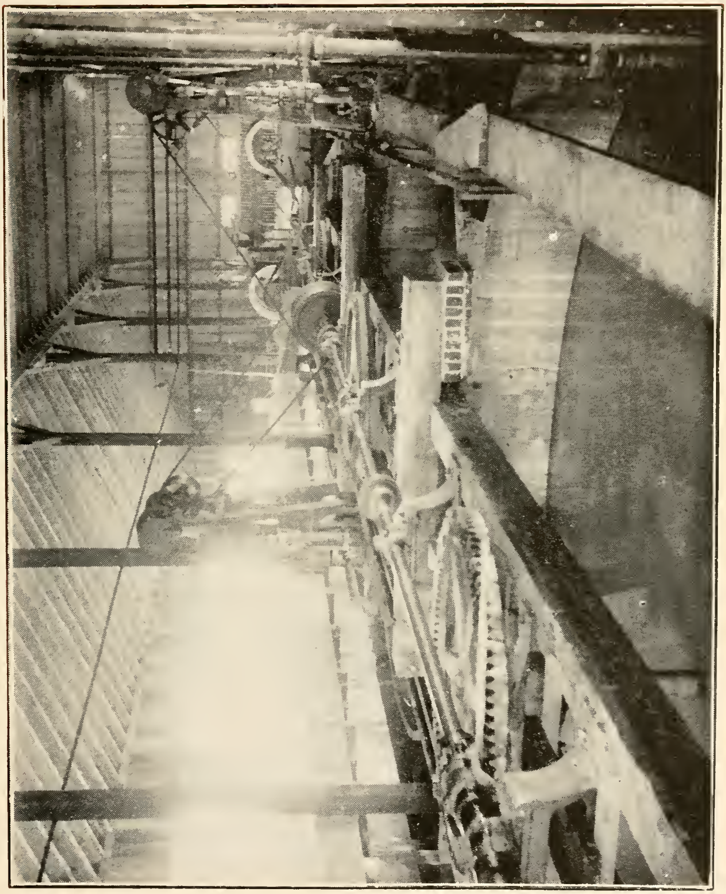
We have equipped clay washing plants all over the country, and make a specialty of contracting for the whole plant complete, ready for operation.

At our factory we have a complete laboratory and testing department for determining the value of a clay, and the necessary process through which it must pass to be marketable. We shall be pleased, therefore, to give expert opinion upon the values of any sample of clay which our customers may submit. We can also make a chemical analysis of a clay at a reasonable rate.

Estimates and illustrations of clay washing plants will be furnished upon application.



CAPACITY
about 100 tons of Clay
per 10 hours



CLAY WASHING PLANT AT NORTH EAST, MD.

A Brief Description of Nos. 1 and 2 Mixing and Washing Outfit

The cut on opposite page shows a complete slip-house plant in one machine, which comprises one double blunger, one double sifter, one agitator, one filter press and one slip pump and on the following pages is shown our No. 1 machine. This machine is built for the express purpose of testing clays, or the manufacture of fine special bodies. It is easily operated by one workman; takes very little power, and is complete in every particular. It requires no foundation, but is wood-screwed down to the floor. It is driven by a tight and loose pulley, friction-clutch, or motor, when desired.

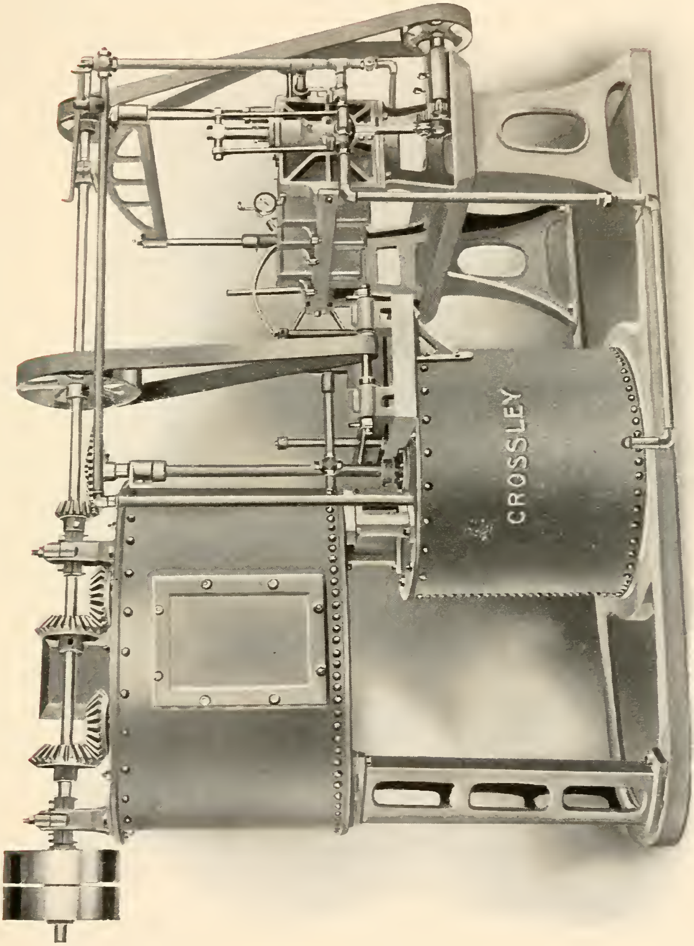
The different kinds of clay, etc., are thrown into the blunger (which is filled with the proper amount of water from a pipe entering at the top) through the hopper shown. When the ingredients have become mixed with water at the proper weight, generally about twenty-two to twenty-eight ounces to the pint, the valve on pipe leading to the sifter is opened and the liquid clay or slip allowed to run through the sifter, which removes all the dirt and sand. The slip then passes into the agitator, which keeps it constantly in motion, thus preventing the clay from settling to the bottom. The slip is pumped from the agitator into the filter press (with pump shown on end of filter press) until the water ceases to flow from the press; it is then evident that the press is full, or pumped up, and it is ready to empty. With a few turns of the handwheel, the press can be opened and the cakes of clay removed; the clay is then ready for use. We build these machines in two sizes, of the following dimensions:

Size	Height	Weight	Export Weight	Floor Space
No. 1	5¼ ft.	2,000 lbs.	2,400 lbs.	4 x 7 ft
No. 2	8 ft.	6,000 lbs.	6,500 lbs.	5 x 11 ft.

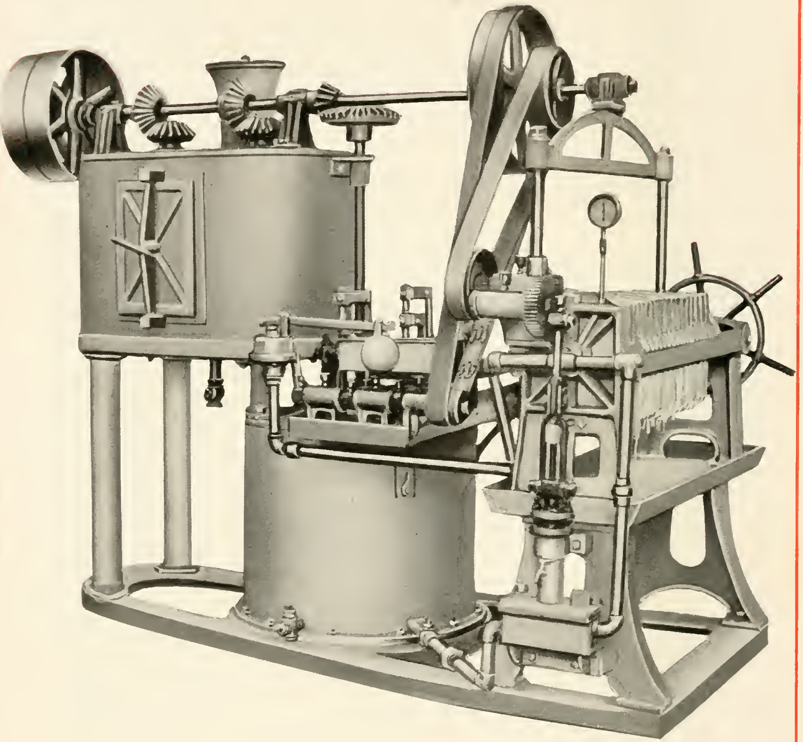
Driving Pulley	Speed	Capacity Per 10 Hours	H. P.
3½ x 15 in.	125	500 to 1,000 lbs.	5
4½ x 20 in.	100	1,500 to 2,000 lbs.	7½

Clay Mixing and Washing Machine

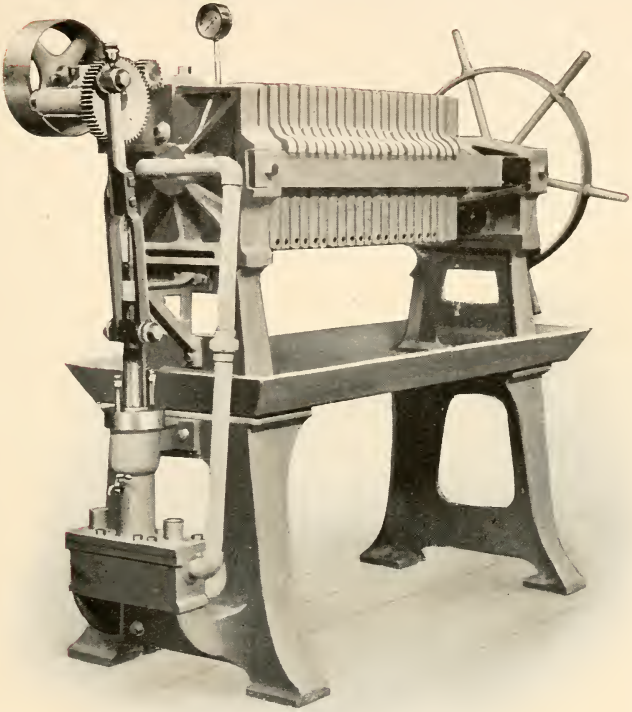
THIS CUT SHOWS OUR No. 2 OUTFIT



No. 1 Clay Mixing and Washing Outfit for Lavatory and Experimental Work



Filter Press and Pump Combined



Designed for the laboratory and for experimental or educational purposes. It is a very economical and efficient process for preparing bodies and clays for experiments.

A valuable outfit for schools of clay working and ceramics, color, paint and drug manufacturers, oil refineries, etc.

Indispensable in experimental departments of large plants.

Size	Height	Weight	Export Weight	Floor Space
No. 1	3 ft.	660 lbs.	800 lbs.	3½ x 1½ ft.
No. 2	4¾ ft.	1,735 lbs.	2,000 lbs.	5½ x 2½ ft.
No. 3	5 ft.	3,000 lbs.	3,500 lbs.	8 x 3 ft.

No. of Leaves	Size of Leaves	Driving Pulley	Speed	Capacity	H. P.
20	9 in. sq.	3 x 8 in. dia.	120	See Filter Press	2
20	12 in. sq.	3 x 10 in. dia.	90	See Filter Press	3
20	18 in. sq.	5½ x 25 in. dia.	120	See Filter Press	5

Filter Press

INDEPENDENT TOP FEED TYPE

We manufacture an improved clay filtering press, which is made with any number of cast-iron chambers desired, each having an independent feed valve, the advantage of this being well known. Another great improvement we have in this machine over the old style wood or iron press is the manner in which the bag or cloth is connected with the leaves. The bags are cut the proper length from a roll of duck, requiring no stitching whatever; the cloth is hung over the leaves an equal length on each side; the liquid clay or slip is filtered between two cloths on each leaf or chamber; the nipple or inlet is placed in the center of the upper part of the chambers.

This machine is built of the very best materials. The valves are made of iron and carefully fitted with bronze plugs; the chambers or leaves are made of soft gray iron and faced perfectly smooth and true. The head blocks are heavy and well ribbed. The side bars are made of wrought iron 1¼ x 6 inches, supported by center legs. The large handwheel is 7 feet in diameter, and is used for pressing the leaves up tight; the large screw is made of hammered steel 3⁷⁄₁₆ inches in diameter, with heavy square thread. The small hand-wheel is used for tightening up the valves. The weight varies according to the number of leaves. The floor space required for a sixty-chamber press is 8 x 18 feet. The space between the legs is 4 feet 4 inches, allowing room for truck to pass under. The capacity is about forty to fifty pounds to the chamber. The time required to pump up a china body is from forty-five to sixty minutes; can be taken out in twelve minutes and operated by two ordinary men or good-sized boys. Our claims for this machine are as follows:

It is substantially and carefully built. Can be filled and discharged in less time than any other in use. The clay is perfectly uniform throughout the press. The cost of bags is less than one-half any other. It is easy to operate.

We have spared no expense to make this press meet the wants of the modern potter and fully guarantee it in every particular.

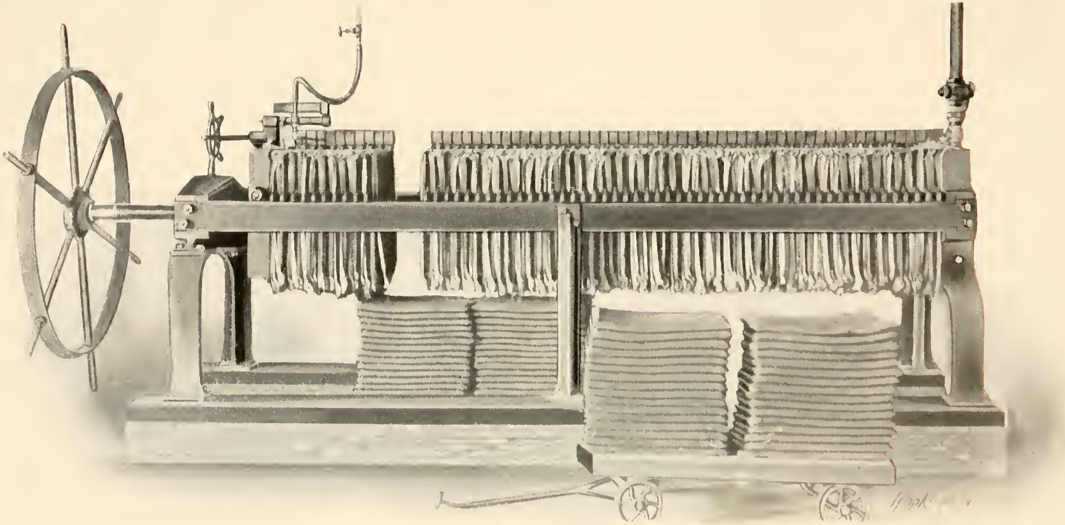
Our filter presses are built in the following standard sizes:

Size of Leaf	No. of Chambers	Capacity Each Chamber	Capacity Each Press	Length of Press Over All Without Hand Wheel	Width of Press Over All	Height of Press Over All	Shipping Weight
24 in. sq.	40	45 lbs.	1,800 lbs.	11 ft.	84 in.	90 in.	10,800 lbs.
24 in. sq.	60	45 lbs.	2,700 lbs.	14 ft.	84 in.	90 in.	14,400 lbs.
24 in. sq.	75	45 lbs.	3,375 lbs.	16 ft.	84 in.	90 in.	17,100 lbs.
24 in. sq.	80	45 lbs.	3,600 lbs.	18 ft.	84 in.	90 in.	18,000 lbs.
24 in. sq.	100	45 lbs.	4,500 lbs.	20 ft.	84 in.	90 in.	21,600 lbs.

The pressure on this press should run from 60 to 80 pounds per square inch.

Filter Press

INDEPENDENT TOP FEED TYPE



THE ONLY FILTER PRESS WITH INDEPENDENT FEED

Our Center-Feed Square-Leaf Filter Press

This cut represents our center-feed square-leaf filter press, and we would call your attention to the construction of same. You will note that our press is so built that the clay can be removed from under the press, thus eliminating the chance of getting grease, etc., in your clay by lifting it out over the side rails, as is such common practice with other types of presses.

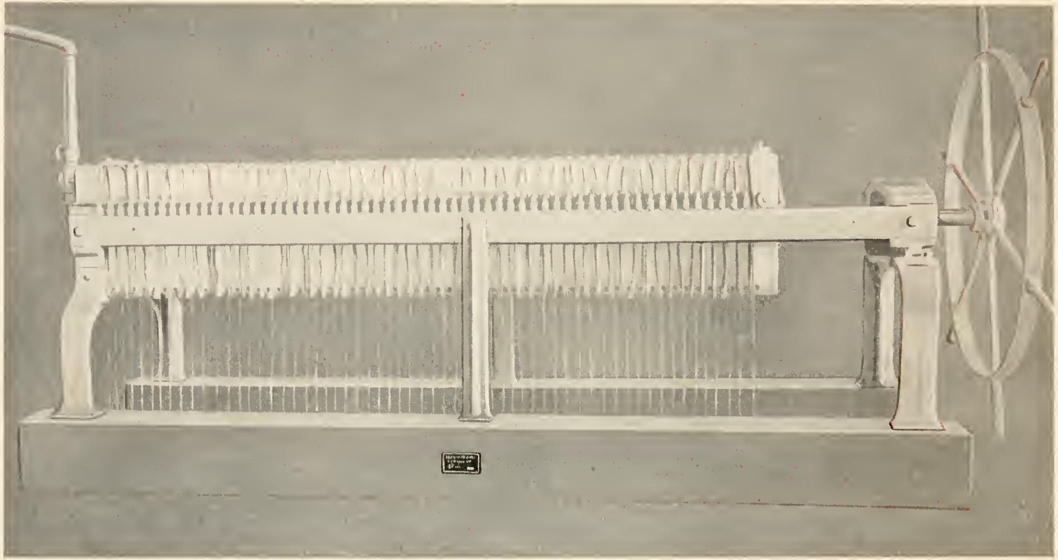
These presses are built of the very best material and workmanship throughout and are of sufficient strength to withstand any strain that they may be put to. The side rails are of 1¼ x 6 inches solid steel bars supported at both ends and in the center with very substantial legs thus insuring the press to be always in alignment, which eliminates a lot of the blow outs that are so common in other type presses. The leaves are faced off perfectly true and parallel, thus eliminating the use of any gaskets whatever in connection with the leaves, also eliminating the constant annoyance and expense of replacing the gaskets. This press can be either furnished with a hand wheel, the same as shown in cut, or with a ratchet attachment, whichever is preferred.

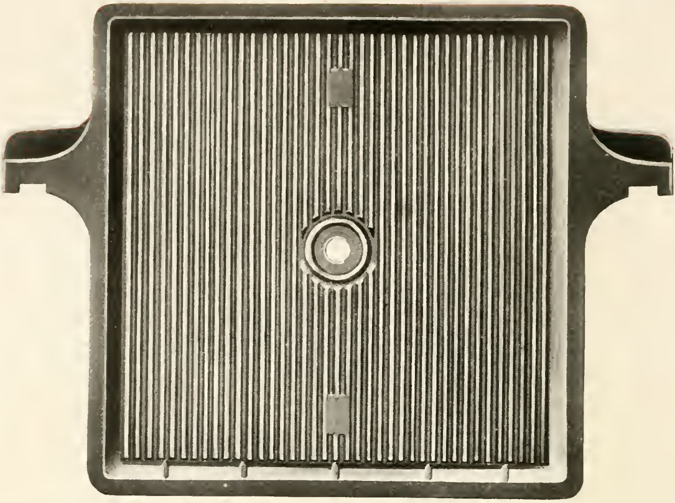
These presses are made in the following sizes:

Size of Leaf	No. of Chambers	Capacity Each Chamber	Capacity Each Press	Length of Press Over All	Width of Press Over All	Height of Press Over All	Shipping Weight
9 in. sq.	20	3 lbs.	60 lbs.	4 ft.	24 in.	42 in.	440 lbs.
12 in. sq.	20	9 lbs.	180 lbs.	5 ft.	36 in.	60 in.	703 lbs.
18 in. sq.	20	27 lbs.	540 lbs.	9 ft.	60 in.	84 in.	2,100 lbs.
24 in. sq.	40	45 lbs.	1,800 lbs.	11 ft.	84 in.	90 in.	10,800 lbs.
24 in. sq.	60	45 lbs.	2,700 lbs.	14 ft.	84 in.	90 in.	14,400 lbs.
24 in sq.	75	45 lbs.	3,375 lbs.	16 ft.	84 in.	90 in.	17,100 lbs.
24 in. sq.	80	45 lbs.	3,600 lbs.	18 ft.	84 in.	90 in.	18,000 lbs.
24 in. sq.	100	45 lbs.	4,500 lbs.	20 ft.	84 in.	90 in.	21,600 lbs.

The pressure on this press should run from 60 to 80 pounds per square inch.

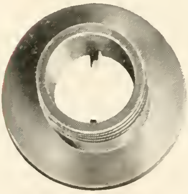
Our Center-Feed Square-Leaf Filter Press



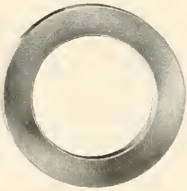


These cuts show the type leaf used in our center-feed square-leaf filter presses and we would call your attention to the simplicity and the low cost of filter press cloths used in connection with same. To make a filter press cloth you take a piece of duck 28 inches wide by 5 feet 2 inches long and punch two holes in same; place same over top of leaf, insert brass nipple and tighten up on nut, which clamps the bag firmly in position and the operation is complete. This can be done complete in less than two minutes, and you can readily see from this that we can save you anywhere

NIPPLE



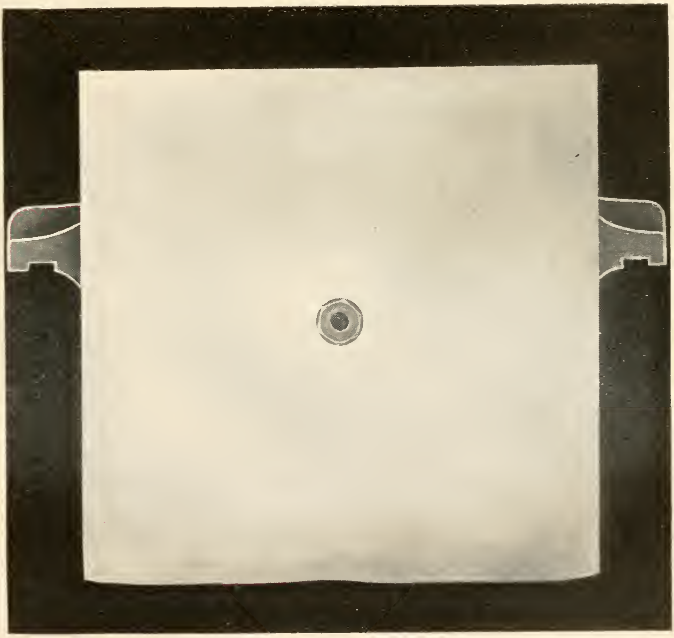
WASHER



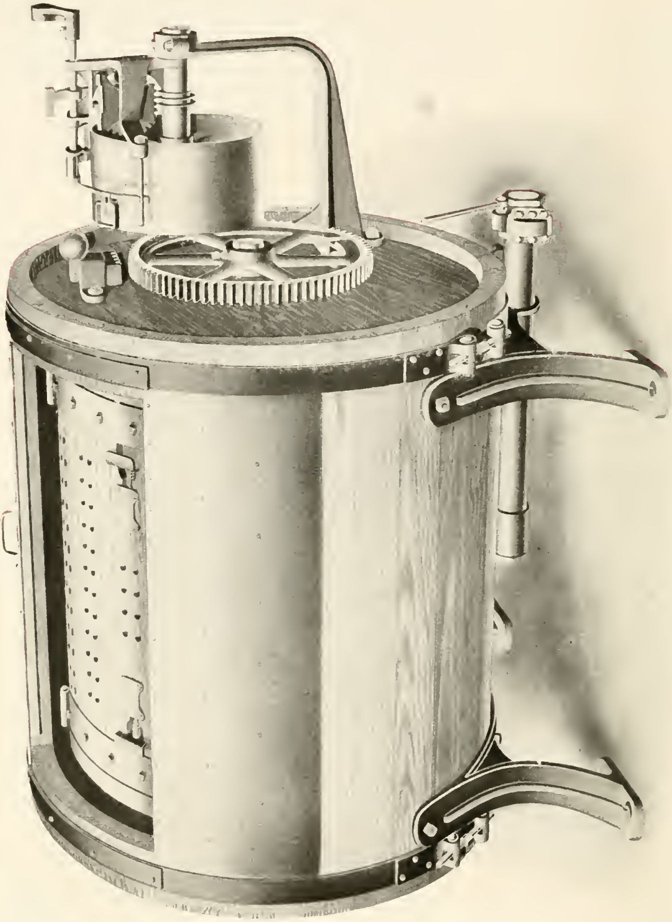
NUT

from 14 to 16 cents each on filter press cloths and will also save you anywhere from three to five minutes in the time it takes to place each cloth in position. You can see from this explanation that there is a considerable saving in this type press over the other types that are in operation. We furnish the brass nipples, nuts and washers complete for each leaf.

Where the bag is clamped to leaf, in the center, this is machined perfectly true on both sides which eliminates possibilities of leaks and will not cut the filter press cloths.



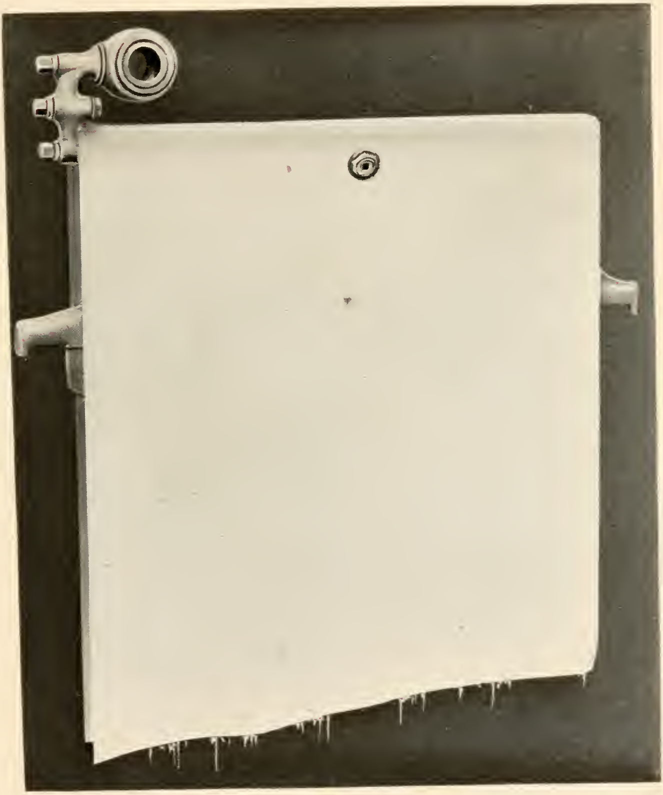
Washing Machine for Filter Press Clothes



PRICES ON APPLICATION

This Cut Shows Clay Press Leaf With Press Cloth and Valve in Position

TOP FEED TYPE



WE CARRY DUPLICATE PARTS IN STOCK

Agitator or Receiving Tank for Slip from Blunger

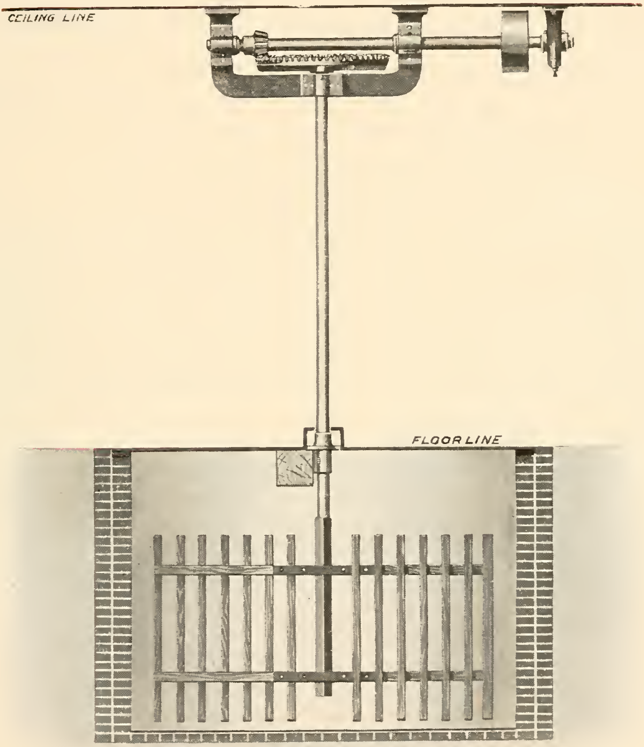
STYLE "A"

This cut shows our clay agitator, which is used for agitating the liquid clay or slip before it is pumped into the filter press. It is lined with vitrified bricks. The arms or wings are made of hard wood, firmly bolted to vertical shaft. The upper part or driving gear is securely fastened to girders or ceiling. The arms can be made any length to suit any diameter of well. The dimensions of this machine are as follows:

Speed of driving pulley	93 r. p. m.
Width of face and diameter	6 x 15 in.
Horse power required	3 h. p.
Shipping weight	800 lbs.

Agitator or Receiving Tank for Slip from Blunger

STYLE "A"



Agitator Heavy Duty

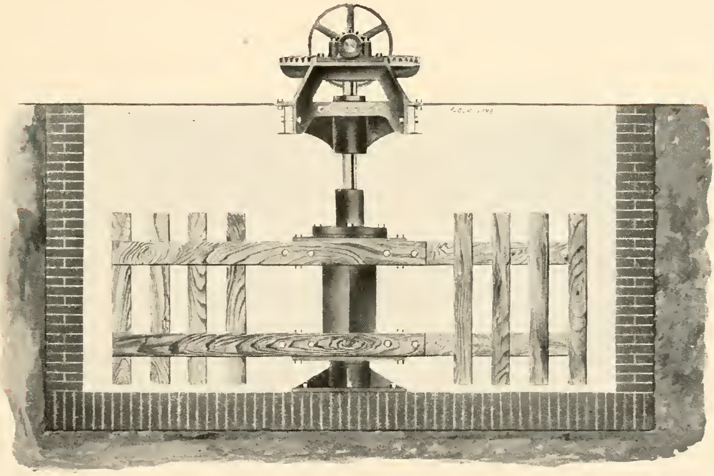
STYLE "B"

Our style "B" agitator is generally used in clay-washing and refining plants. It is also used in potteries, tile works and other clay-working establishments. The clay, after being blunged up in the blunger or mixer, is allowed to run into this agitator through the sifter. The arms revolving, keep the liquid clay in constant agitation, thus preventing it from settling to the bottom, until it is wanted for use. The arms are made of hard wood and bolted fast to the vertical shaft. The shaft and arms can be made to suit any depth or diameter of well.

The weight and other dimensions of this machine depend altogether upon the size of well in which it is to be placed.

Agitator Heavy Duty

STYLE "B"



Improved Stepless Blunger

The illustration on the opposite page shows our improved double stepless blunger or mixer, which is used in pottery, tile, terra cotta, electric porcelain plants and all clay working plants where it is desired to mix up different kinds of clays and other materials into a liquid form to be pumped into filter presses.

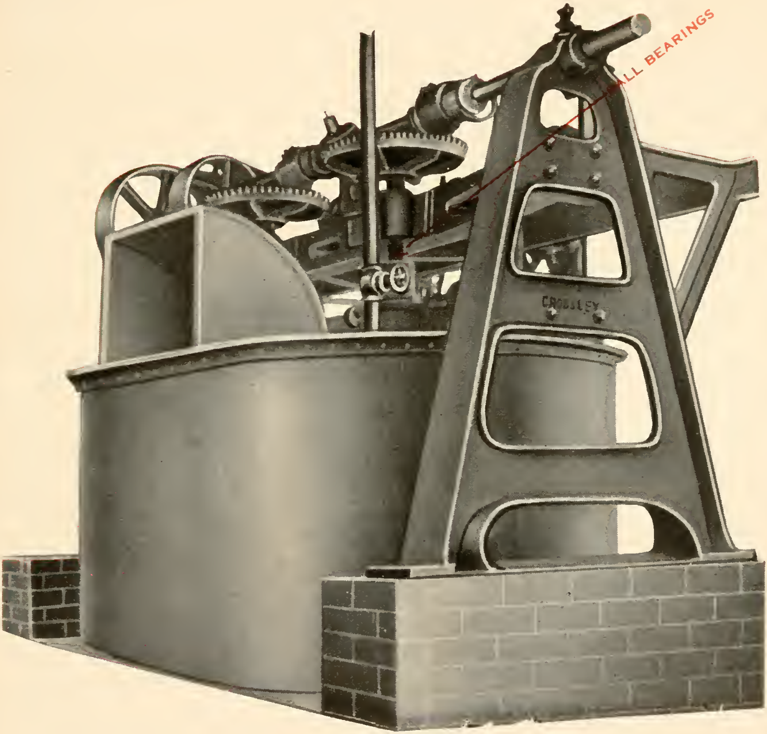
This blunger is a great improvement over our former production. It is made of the very best material throughout, the tank is made of heavy tank steel, which is lined with vitrified brick. The housings or "A" frames, separators and gears are made of the very best grade of gray iron. There are two heavy vertical steel shafts running in opposite direction, which are supported with a substantial thrust ball bearing and which is bolted to bottom separator. There are two steel arms or beaters bolted to each of these shafts. These arms or beaters are so constructed that they tend to raise and keep the lumps and other materials from settling to the bottom of the tank. In blunging clay this material should be blunged to a consistency of twenty-four to twenty-seven ounces to the pint, which is about the proper weight to be handled economically.

When two or more of these machines are desired we can construct them in rows or sets driving them from same line shaft. These machines are made in two standard sizes of the following dimensions:

(We do not furnish Vitrified Brick Linings for tanks only on special requests and for which we charge extra.)

	Height	Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.	Export Weight
No. 1	8 ft.	3,000 lbs.	7 ft. x 9 ft.	8 in. x 24 in.	90 rev. per min.	2,500 lbs.	7½	8,000 lbs.
No. 2	10 ft.	6,000 lbs.	7 ft. x 13 ft.	10 in. x 30 in.	120 rev. per min.	7,000 lbs.	10	11,400 lbs.

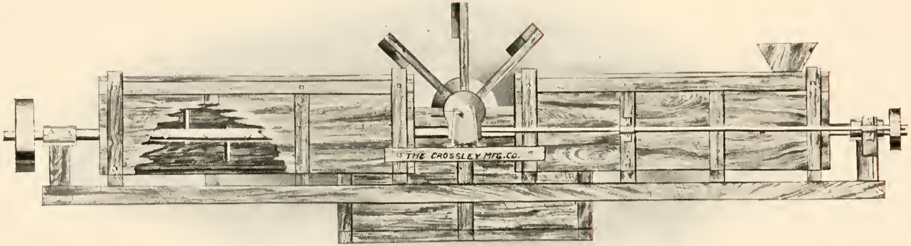
Improved Stepless Blunger



Clay Washer and Sand Wheel Combined

Our clay washer and sand wheel combined is principally used in clay-washing plants for removing the sand and stones from the clay. The large box at the hopper end of the washer receives the clay just as it comes from the mines, and after being mixed with water to the proper consistency, it runs out through a spout to the sand wheel, which picks up the slip or liquid clay, allowing the clay substance to pass into the next box, the sand and stones remaining in the buckets until it reaches the bottom, when it is dropped into a receiver, or box, to be removed as sand. The beater arms are constantly in motion, thus breaking up all the lumps and thoroughly dissolving the clay. This machine is invariably built to meet the existing requirements; it is therefore impossible to have a standard size. We shall be pleased to send dimensions and further information upon request.

Clay Washer and Sand Wheel Combined


THE CROSSLEY MFG. CO.

LET US ESTIMATE ON YOUR REQUIREMENT IN THIS LINE

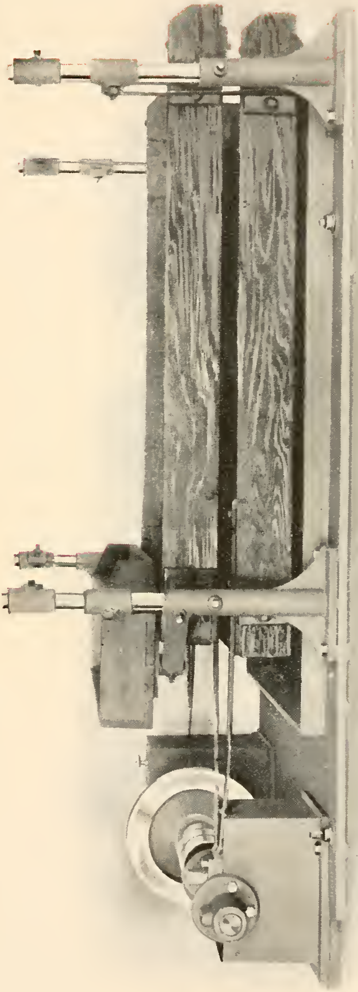
Vibrating Sifter or Lawn

This sifter has been proven, by years of careful study and experimenting, to be the best that experience can produce. We believe we have solved a problem, in this machine, that has long worried the potter and clay-worker and we are glad to offer it to the trade.

The slip is run into the box on top of the machine; from thence it drops through the top screen, which is generally of a coarser mesh than the bottom screen, and passes through the lower one and thence to the receiver, free from sand, grit, etc., ready for use. Owing to the high speed at which this machine runs, it can be appreciated how necessary it is that the materials and workmanship must be of the best, which fact will be found to be carried out in this machine. It is built in two sizes, of the following dimensions:

Size	Height	Weight	Export Weight	Floor Space
A	2½ ft.	1,000 lbs.	1,400 lbs.	4 x 6 ft.
B	2½ ft.	1,200 lbs.	1,600 lbs.	4½ x 7 ft.

Driving Pulley	Speed	Capacity	H. P.
5 x 5 in.	750	Depends on nature of clay	1½
5 x 5 in.	750	Depends on nature of clay	1½

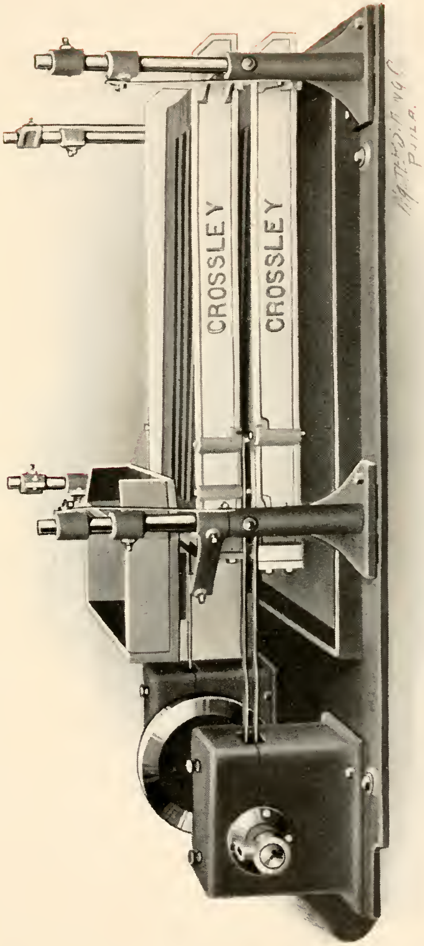


Vibrating Sifter or Lawn

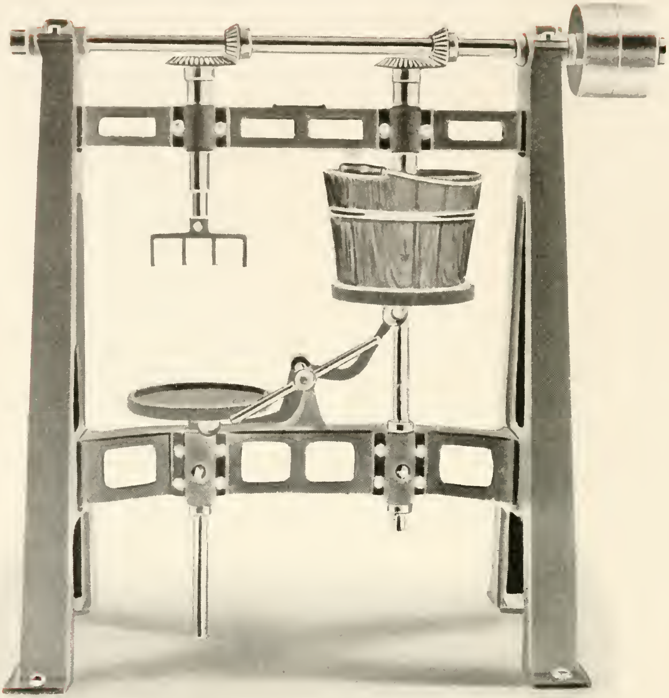
Aluminum Framed Vibrating Lawn or Sifter

Our aluminum framed lawn as shown on the opposite page is built exactly the same as our standard lawn with the exception that it has aluminum frames instead of wood, which insure perfect alignment at all times and requires no replacing as they are practically indestructible, and will last the life-time of the machine. They are fitted with an inside frame of wood to which the cloth is fastened.

Aluminum Framed Vibrating Lawn or Sifter



Bucket Blunger or Mixer



This machine was designed for use in the laboratory or mixing-room, for blunging up small quantities of material. Ordinary buckets are used, thus permitting several different mixtures to be blunged simultaneously. It is a very simple and well-built machine, and is essential to every mixing-room, requiring a very small amount of power and taking up very little space.

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.
4 ft.	300 lbs.		2 x 3½ ft.	2½ x 7 in.	60	Two ordinary buckets	¾

Pug Mills (Vertical Type)

(ILLUSTRATIONS ON PAGES 40 AND 41)

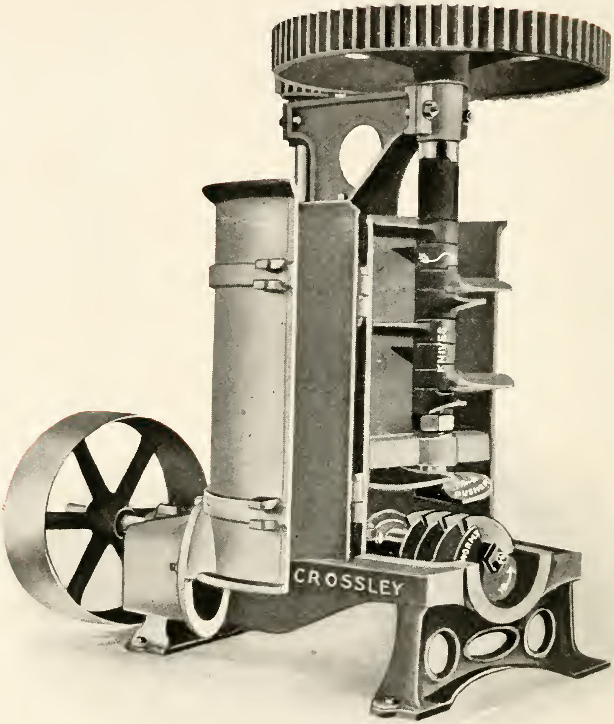
In our pugging machine we have combined both simplicity and durability in an effort to build a machine that would meet the requirements of the clay worker. Owing to the principles upon which this machine is based, we are safe in saying that this pugging machine is the best on the market. The 12-inch machine is generally used in small plants, or for laboratory and experimental purposes. The 20-inch is the standard pug mill for potteries, for pugging china and general potters' clay. The 24-inch mill is used for wedging and pugging sagger clay and fire clay. There is a series of knives and worms in the barrel, which cut and compress the clay into a homogeneous mass, thereby freeing it of lumps, air blisters, etc. The clay is forced out at the bottom through the mouth piece, which is made in any form desired, generally round or square. We build these machines in three sizes, of the following dimensions:

Size	Height	Weight	Export Weight	Floor Space
12 in.	4 ft.	550 lbs.	700 lbs.	24 in. x 48 in.
20 in.	6 ft.	3,000 lbs.	3,600 lbs.	36 in. x 72 in.
24 in.	7 ft.	6,000 lbs.	6,500 lbs.	42 in. x 7 ft. 6 in.

Driving Pulley	Speed	Capacity	H. P.
4 x 18 in.	175	4 tons per day	3
8 x 24 in.	140	15 tons per day	5
T. L. 10 x 30 in.	110	30 tons per day	10

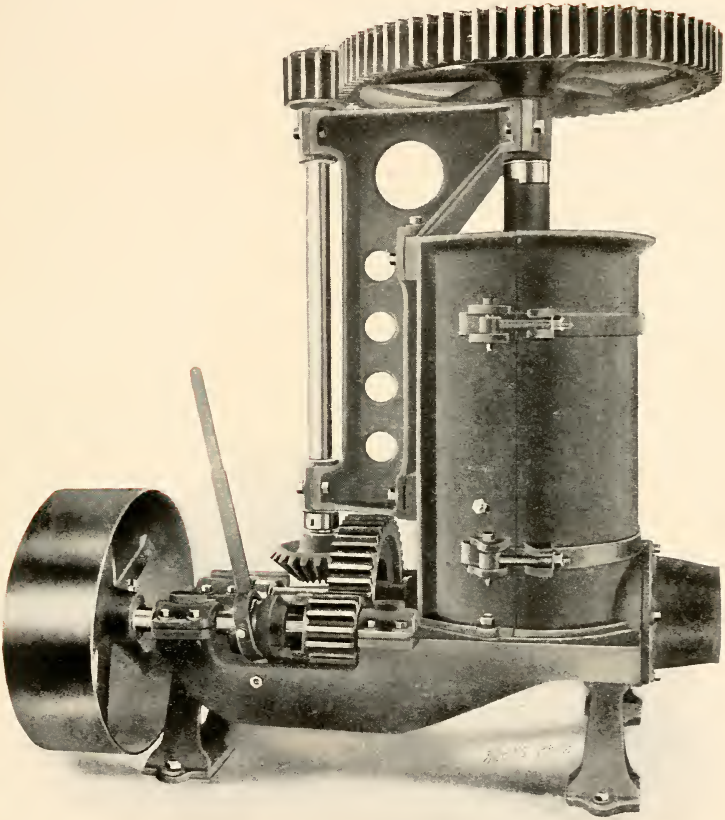
Pugging Machine

SHOWING INTERIOR



When ordering knives, worms, pushers, or other parts of pug mills, state diameter of barrel and whether "A" or "B" is on the knives.

Pugging Machine



Horizontal Low-Down Pug Mill

We are offering to the trade a specially constructed horizontal low-down pug mill, which is far superior to any that has yet been placed on the market.

It is of easy access for feeding being close to the floor and can be furnished with either right hand or left hand discharge nozzle, to suit requirements.

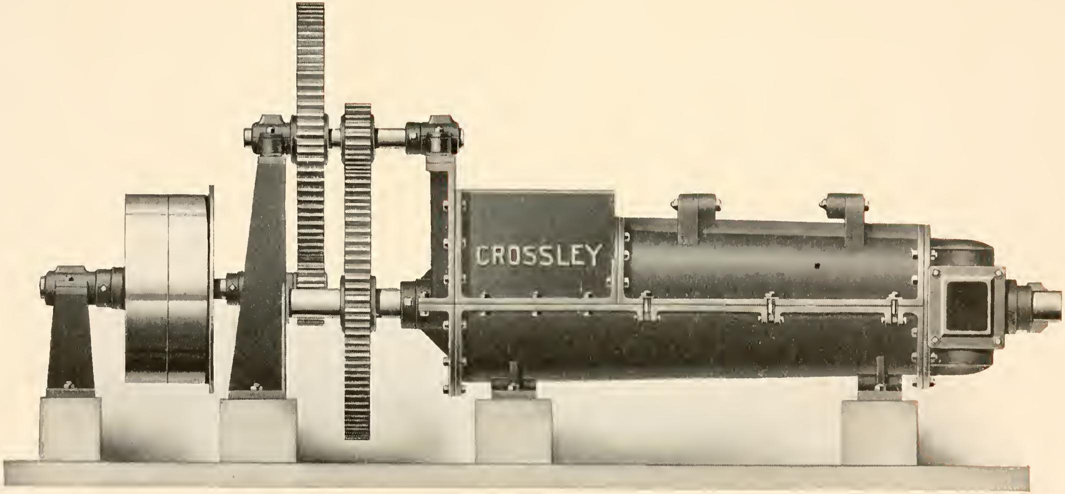
All parts are of easy access and can be readily removed and replaced. You will note that the barrel is hinged and when cleaning out mill you unloosen the bolts and raise half of barrel on hinges. This gives the operator an opening the full length of the machine.

This machine is of a very heavy construction throughout and the gearing is made of a special semi-steel and all wearing parts are arranged so that they can be adjusted.

The main or knife shaft is made of steel and provided with a ball-bearing thrust, which reduces the friction to a minimum, and is filled with our patented interlocking knives.

This mill can be used for the pugging of sagger clay, fire clay and semi-porcelain and requires the following floor space, horse-power, etc.:

Floor Space	H. P.	Weight	Export Weight	Capacity	Pinions Shaft Speed
13 ft. 6 in. x 4 ft. 6 in.	10	5,000 lbs.	5,500 lbs.	40 to 50 tons per day	150 R. P. M.



Horizontal Low-Down Pug Mill

No. 1 Belt-Driven Pump

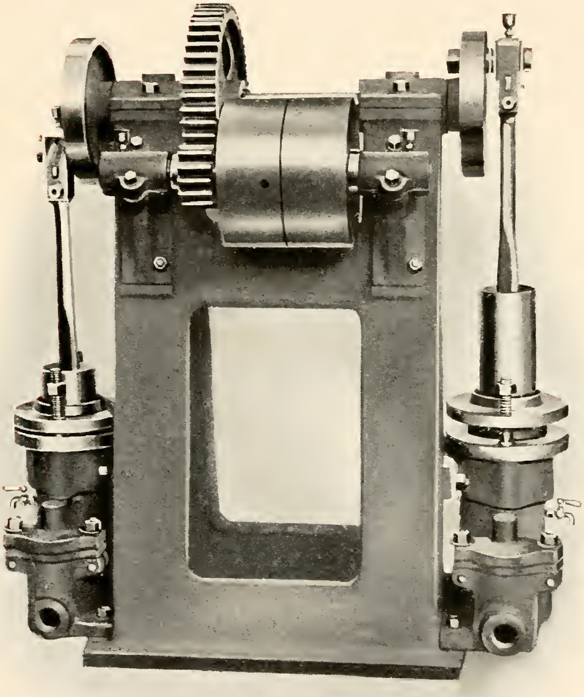
Our No. 1 belt-driven pump is of entirely new design and construction, and built especially for potters' and clay-workers' use. The valve and valve-chambers are constructed for pumping water, glaze, liquid clay and other gritty substances, and are easy of access; by releasing two hinged bolts, the worn parts can be replaced. Machine-cut gears are used on this pump, and all the parts are accurately made with the best materials and workmanship. We build this machine in one size only, of the following dimensions:

Height	Weight	Export Weight	Floor Space
4 ft.	1,000 lbs.	1,300 lbs.	1½ x 3 ft.

Driving Pulley	Speed	Capacity	Suct. Pipe
4 x 10 in. T. L.	120	20 gal. per minute	1½ in.

Disc. Pipe	Stroke	Dia. of Plung.	H. P.
1½ in.	6 in.	4 in.	3½

No. 1 Belt-Driven Pump



No. 2 Belt-Driven Pump

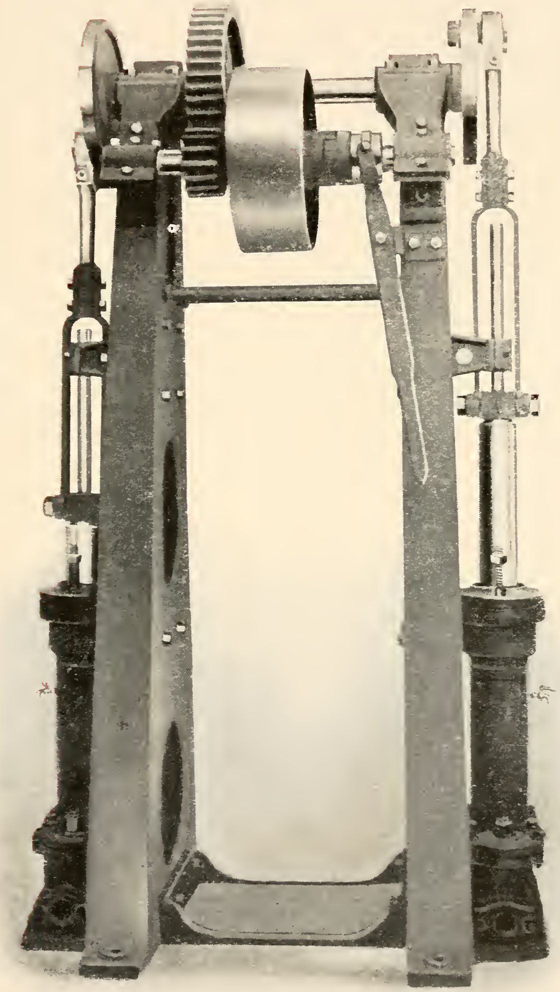
Our No. 2 belt-driven pump is very similar to the No. 1 pump, excepting it is of larger capacity, having a much longer stroke and being a much heavier machine throughout. Its dimensions are as follows:

Height	Weight	Export Weight	Floor Space
7¾ ft.	3,000 lbs.	3,600 lbs.	3 x 4 ft.

Driving Pulley	Speed	Capacity	Suct. Pipe
6½ x 18 in.	80	30 gal. per minute	2 in.

Disc. Pipe	Stroke	Dia. of Plung.	H. P.
2 in.	11 in.	4 in.	5

No. 2 Belt-Driven Pump



Four-Cylinder Slip Pump

This is our four-cylinder slip pump which we are putting on the market for use in connection with filter presses and is the first pump of this character that has ever been presented to the clay worker.

By the use of this pump you are able to get a constant flow of slip to the filter press, also a steady pressure, and you are enabled to increase the capacity of your presses. This will save you considerable time in the pumping up of your presses also wear and tear on the filter press cloths, as the filter press cloths are not subjected to any pulsations, as are characteristic with a two-cylinder pump, as the slip comes from this pump in one continual flow.

The crank shaft is made of a special nickel steel, the connecting rods and brasses are so fitted up that the wear can be readily taken care of, the straps and yoke are of carbon steel forged and turned to shape, the valve seats and valves are made of the very best bronze, the manifold connections for the intake and discharge are made in one casting, which are bolted to the valve chambers of the pump by flanges arranged for this purpose and the workmanship is of the usual Crossley standard. The machine is self-contained in every respect, having large oil and grease cups placed wherever necessary.

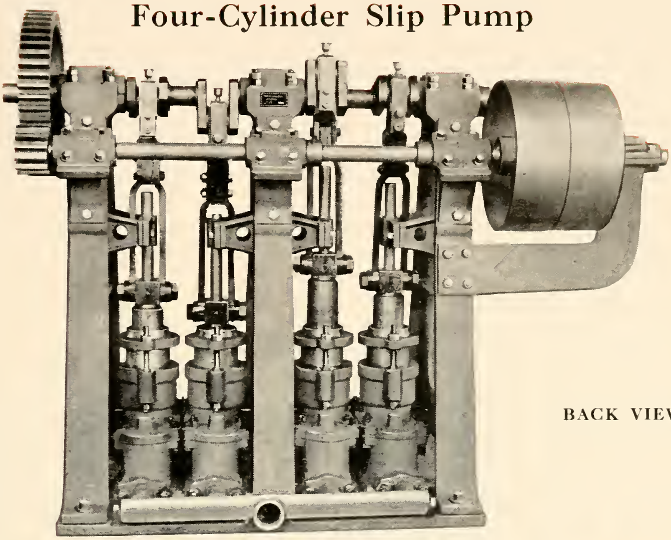
This machine is furnished with tight and loose pulley (can also be arranged for geared motor drive) and is of the following dimensions:

Cylinder	Height	Weight	Export Weight
4	5 ft.	4,200 lbs.	4,400 lbs.

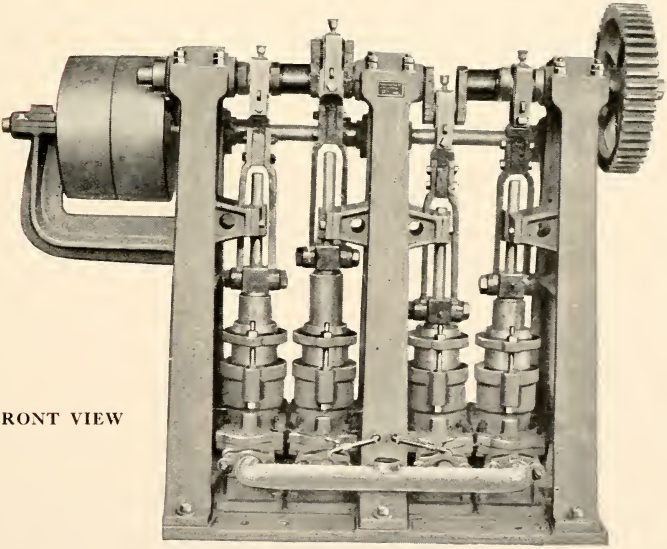
Floor Space	Speed R. P. M.	Driving Pulley	H. P.
5 ft. 9 in. x 3 ft.	120	18 x 6½ in.	6

Capacity 40 gallons per minute.

Four-Cylinder Slip Pump



BACK VIEW



FRONT VIEW

Four Cylinder Slip Pump

ECCENTRIC TYPE

This cut shows our eccentric type four cylinder slip pump, which is exactly the same as the four cylinder pumps shown on the preceding pages with the exception that it is fitted with eccentrics instead of a crank shaft.

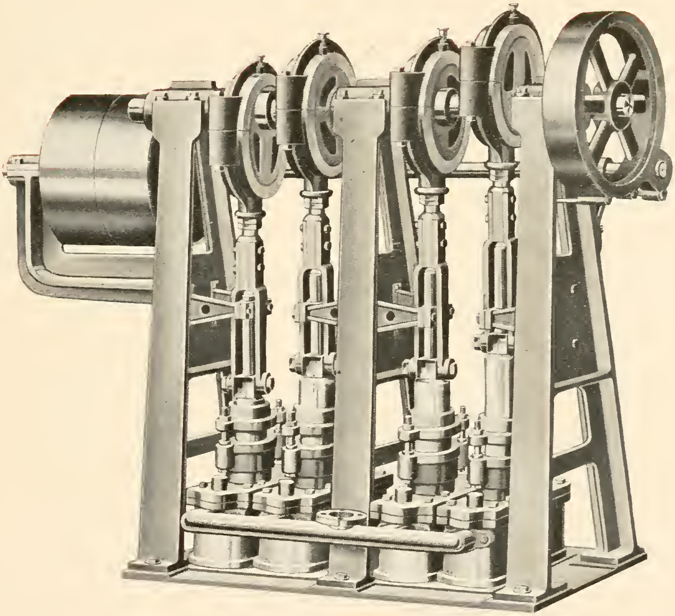
All parts are interchangeable and pump is built of the very best material and workmanship throughout. It is very compact and requires very little space for the capacity produced. Built in one size only of the following dimensions:

Cylinder	Height	Weight	Export Weight	Floor Space	Speed R. P. M.	Driving Pulley	H. P.
4	5 ft.	4,200	4,400	5 ft. 9 in x 3 ft.	120	18 x 6½ in.	6

Capacity 40 gallons per minute.

Four Cylinder Slip Pump

ECCENTRIC TYPE



Wet or Dry Pan

STYLE "A"

5 FEET IN DIAMETER

Owing to the fact that it is necessary to construct a very strong machine for grinding grog from saggers, bricks, terra cotta and other materials, we have designed a machine which is strong where strength is needed, and at the same time having no superfluous weight. We believe that in our standard wet or dry pans we have built a machine that will successfully withstand the constant strain placed upon it. This machine is self-contained, having the vertical shaft bottom bearing connected by means of the iron separator to the base of the housings. The materials are thrown into the revolving pan, which has screen plates on the bottom. There are two aprons or diverter arms in front of the rollers, which keep all the material under the rollers to be crushed. The crushed material passes through the screen plates and under the machine, where it is caught in a bin.

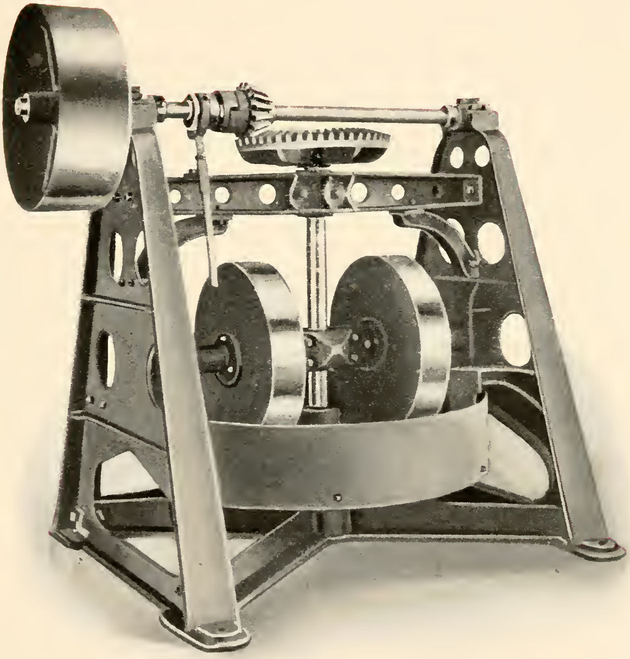
This machine has as few working parts as possible, thereby minimizing the repairs. Electric-motor drive, direct connected, can be furnished for this machine when desired.

Height	Weight	Export Weight	Floor Space
7 ft.	7,000 lbs.	7,650 lbs.	6 x 6½ ft.

Driving Pulley	Speed	Capacity	H. P.
24 x 8 in.	120	30 to 40 tons per day	8

Wet or Dry Pan

STYLE "A"



MADE IN ONE SIZE ONLY

Grog Mill or Dry Pan

STYLE "B"

These mills are used for grinding and breaking up fire bricks, saggers, sewer pipe, etc., which can be ground to suit any requirements by the application of proper size screen plates.

This type machine is fitted with independent crusher wheels, that is, when a piece of material is being crushed under one wheel it does not effect the other, which not only increases the life of the machine but reduces the cost of repairs to a minimum.

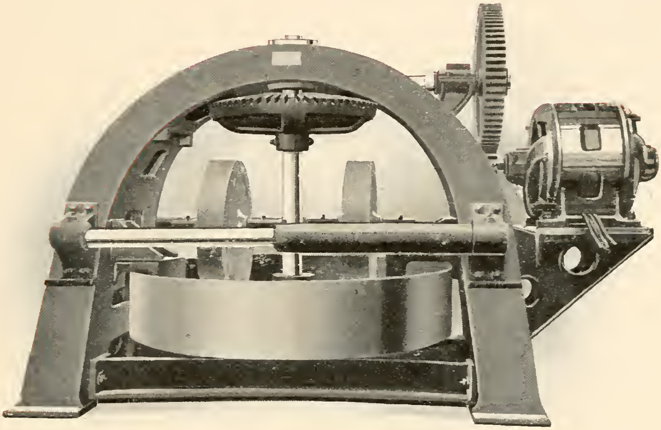
We make this mill in three sizes, as given below, with either motor drive, jaw or friction clutch or tight and loose pulley. Jaw clutch drive furnished unless otherwise specified.

Size	Height	Weight	Export Weight
4 ft.	5 ft. 3 in.	6,000 lbs.	6,400 lbs.
6 ft.	8 ft.	13,000 lbs.	13,500 lbs.
7 ft.	9 ft. 5 in.	17,600 lbs.	18,500 lbs.

Floor Space	Driving Pulley	Capacity per 10 hours	H. P.	Pinion Shaft Speed
4 ft. 6 in. x 7 ft.	24 x 8 in.	40 to 60 tons	8	125
6 ft. 6 in. x 10 ft.	30 x 10 in.	80 to 90 tons	15	140
12 ft. x 6 ft.	36 x 12 in.	90 to 110 tons	20	90

Grog Mill or Dry Pan

STYLE "B"



The above cut shows our motor driven style "B" grog mill or dry pan, which is one of the heaviest and most substantially built machines of this character on the market. The frame is heavily ribbed and is constructed so that the entire machine is self contained in every respect.

Our Improved Wet Pan

STYLE "B"

The cuts, on the opposite page, show a front and rear view of our improved style "B" wet pan, which is one of the heaviest and most substantially built machines of this character on the market. The frame is heavily ribbed and is constructed so that the entire machine is self contained in every respect, requiring no center support or foundations.

It is used for mixing and tempering clays or any other materials of a like nature.

This type machine is made in three sizes, as given below, and can be furnished either with direct motor drive, jaw or friction clutch or tight and loose pulley.

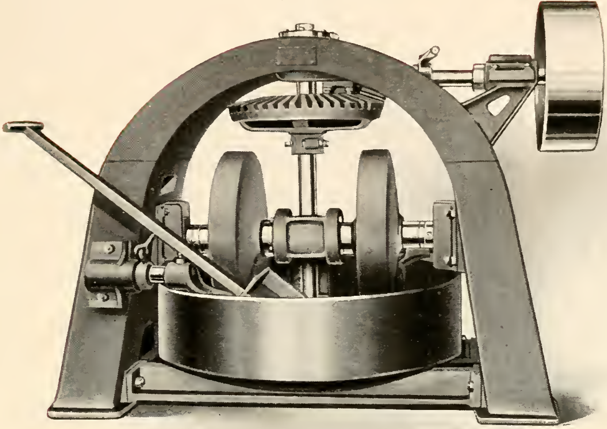
Further information in regard to size, etc., given upon application.

Size	Height	Weight	Export Weight
4 ft.	5 ft. 3 in.	6,000 lbs.	6,400 lbs.
6 ft.	8 ft.	13,000 lbs.	13,500 lbs.
7 ft.	9 ft. 5 in.	17,600 lbs.	18,500 lbs.

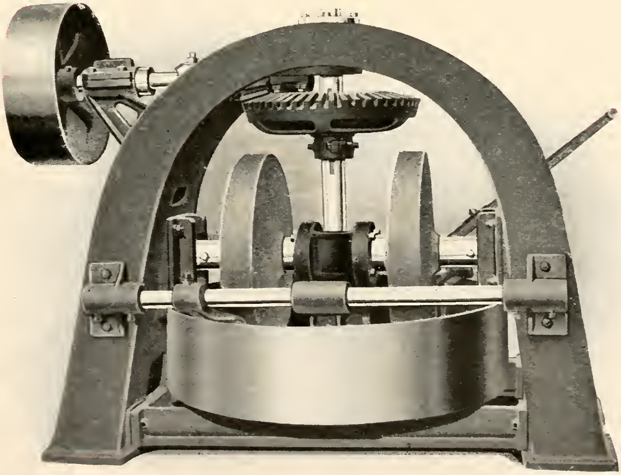
Floor Space	Driving Pulley	Speed
4 ft. 6 in. x 7 ft.	24 x 8 in.	125
6 ft. 6 in. x 10 ft.	30 x 10 in.	140
12 ft. x 7½ ft.	36 x 12 in.	90

Our Improved Wet Pan

STYLE "B"



FRONT VIEW



REAR VIEW

Our Improved 6-Foot and 7-Foot Wet Pans

STYLE "B"

The cuts on the opposite page show a front and back view of our improved 6-foot and 7-foot style "B" wet pans. This type mill is one of the heaviest and most substantially built machines of this character on the market. The frame is heavily ribbed and is constructed so that the entire machine is self-contained in every respect, requiring no center support or foundations.

They are used for mixing and tempering clays or any other material of a like nature.

This type machine is made in two sizes, as given below, and can be furnished with either direct motor drive, jaw or friction clutch or tight and loose pulley.

On these mills the muller wheels are fitted with special steel tires 1¼ inches thick, and when worn out can be replaced at a small cost, thus eliminating the purchasing of new muller wheels. We would call your attention to the position in which we place the muller wheels, as these are placed so they do not run in the same track, thus making a thorough amalgamation of the clay.

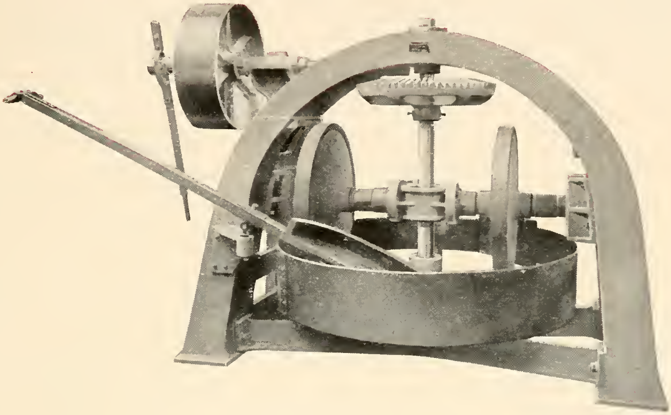
These machines are made of the following dimensions:

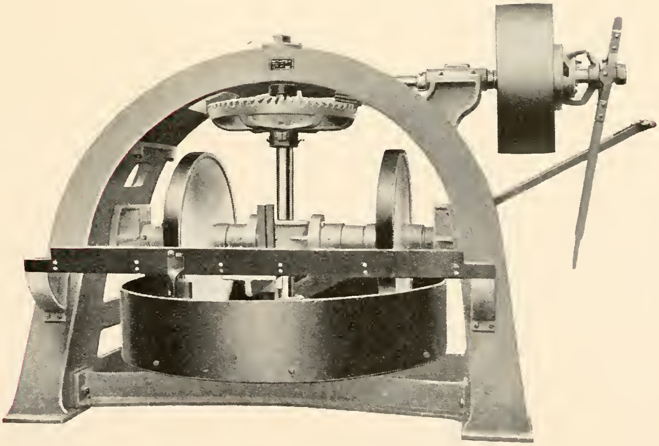
Size	Weight	Export Weight	Height	Floor Space
6 ft.	13,000 lbs.	13,500 lbs.	8 ft.	6½ x 10 ft.
7 ft.	16,100 lbs.	17,100 lbs.	9 ft. 5 in.	7½ x 12 ft.

Driving Pulleys	Speed R. P. M.	Capacity	H. P.
30 x 10 in.	140	30 tons	15
36 x 12½ in.	90	40 tons	20

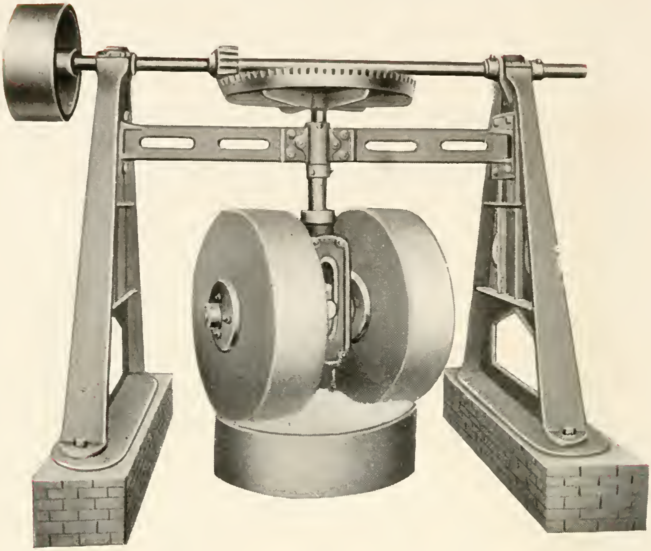
Our Improved 6-Foot and 7-Foot Wet Pans

STYLE "B"





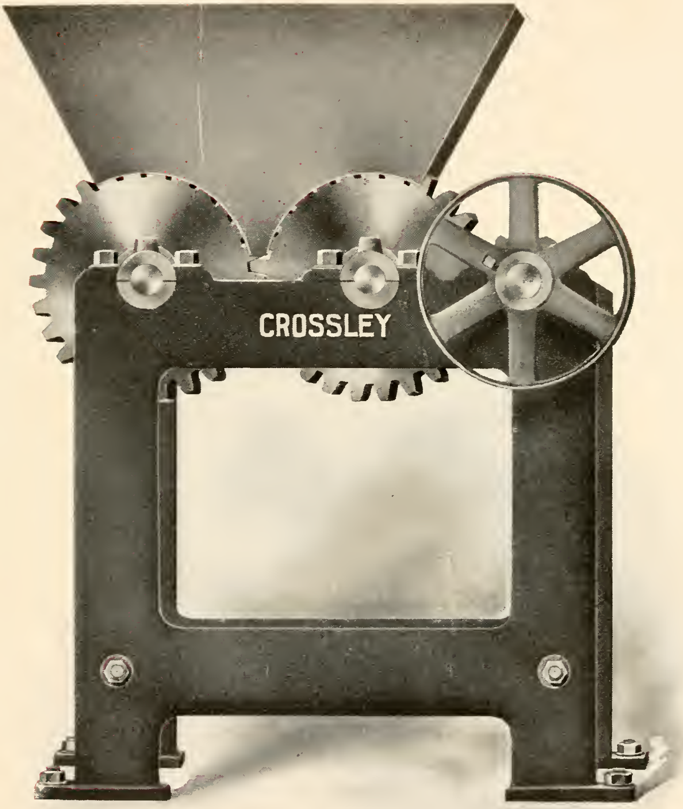
Fret Grinder or Chaser Mill



This illustration represents our machine for grinding frets, broken biscuit ware, flint, spar and other materials. It is constructed with a view to strength and economy. The stones and runners are made of the best New York State burr stone or granite, which has the reputation for its hardness and strength. This machine is furnished with friction clutch or electric motor drive when desired. The stones are made in sizes, depending upon the materials to be ground—42-inch and 48-inch by 12-inch face, and 5-feet 6-inch diameter by 18-inch face. Its capacity depends upon the materials being ground.

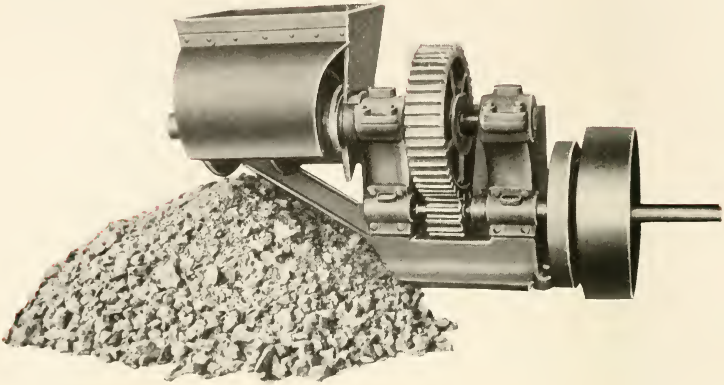
Height	Weight	Export Weight	Floor Space	Speed	H. P.	Size of Stones
8 ft.	About 8,000 lbs.	8,500 lbs.	7 x 8 ft.	65	8 to 10	42 x 12 in. 48 x 12 in.
11 ft. 6 in.	13,000 lbs.	13,800 lbs.	9 ft. 6 in. x 16 ft.	50	10 to 15	5 ft. 6 in. x 18 in.

Clay Disintegrator



THIS MACHINE IS USED FOR BREAKING UP CLAY IN A SEMI-DRY STATE BEFORE ENTERING DUST BLOWER OR PULVERIZER

Improved Clay Disintegrator



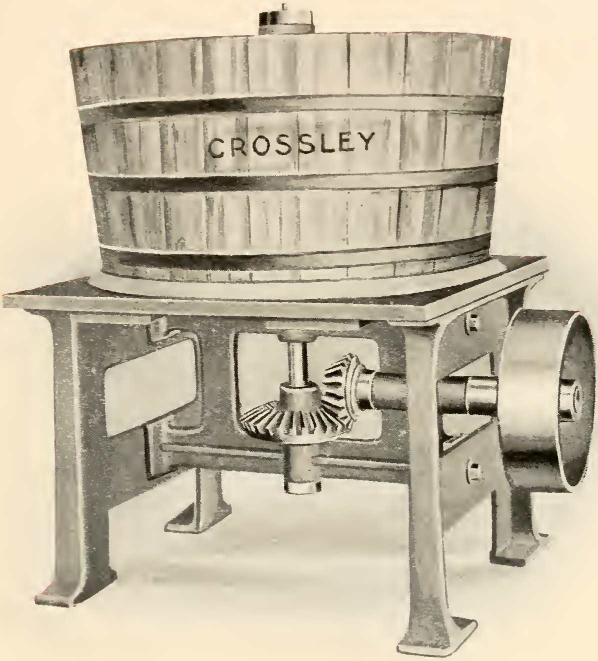
This disintegrator is used for the breaking up of large lumps of clay before entering the blunger, which reduces the time taken to blunge the material. It is also used for the breaking up of sagger clays, crucible clays, etc. The illustration shown above was taken from an actual working condition showing how the machine works on a tough German ball clay such as is used in the manufacture of crucibles.

MADE IN THE FOLLOWING SIZES:

Size	Height	Weight	Export Weight	Floor Space	Speed	Pulley	H. P.
No. 1	3 ft.	800 lbs.	1,000 lbs.	2½ x 6½ ft.	120	4½ x 20 in.	5
No. 2	3 ft.	2,000 lbs.	2,400 lbs.	2½ x 7½ ft.	120	6 x 20 in.	8 to 10

Color or Glaze Mill

STYLE "AA"



We have designed this machine for the dipping room in potteries where it is desirable to keep the glaze or color constantly in motion while the ware is being dipped. The liquid is kept agitated by the vertical shaft running up through the bottom of the tub, on which is connected arms, which revolve through the material, thereby keeping the heavy particles from settling to the bottom. This machine is very simple in construction and requires very little power to operate.

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.
3 ft.	About 600 lbs.	750 lbs.	2½ x 2½ ft.	3 x 16 in.	30	23 gals.	1

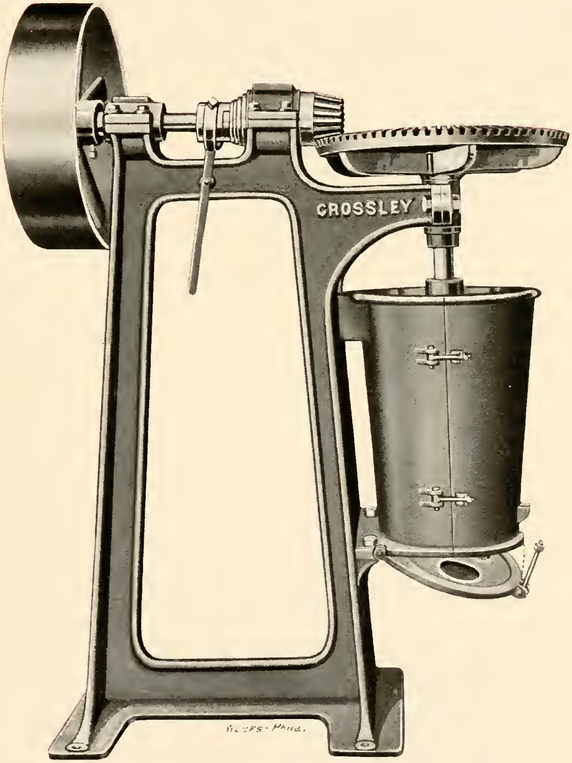
Belt-Driven Wad Machine

We have this wad machine in use in a great many potteries in this country, and it has been giving entire satisfaction wherever it is installed. The barrel and the bottom are hinged, and in cleaning the machine it is only necessary to release the two bolts and barrel will swing back on its hinges, allowing the operator full access to the barrel. It is fitted with our patented interlocking knives which give you the proper pitch for the compression of the clay. It is also fitted with a hinge bottom allowing you full access to the dies.

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.
7½ ft.	2,000 lbs.	2,400 lbs.	3 x 5 ft.	6 x 30 in. T. L.	50	Depends on nature of clay	5

This machine can be arranged to make tubes, squares or any particular shapes desired.

Belt-Driven Wad Machine



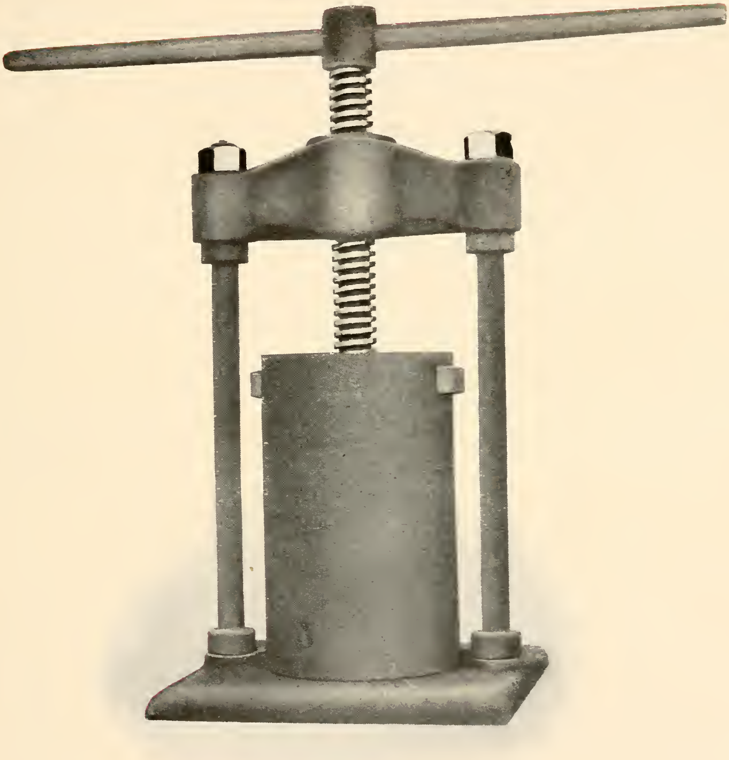
Hand-Wad Machine

Our hand-wad machine is generally used in small plants, where power is not available. It is operated by means of the hand-bar and screw, which is of such a pitch that it works very easily. It is a very well built machine, whose simplicity of design will be apparent at a glance. When the machine needs cleaning, the barrel can be removed by merely sliding it off the base, after raising the screw up to its full height. We furnish dies with each machine. It is built in one size only, of the following dimensions:

Height	Weight	Export Weight	Floor Space	Diameter of Barrel	Height of Barrel	Capacity
30 in.	300 lbs.	375 lbs.	18 x 18 in.	8 in.	14 in.	Depends on nature of clay

We can furnish dies to make any forms or shapes desired.

Hand-Wad Machine



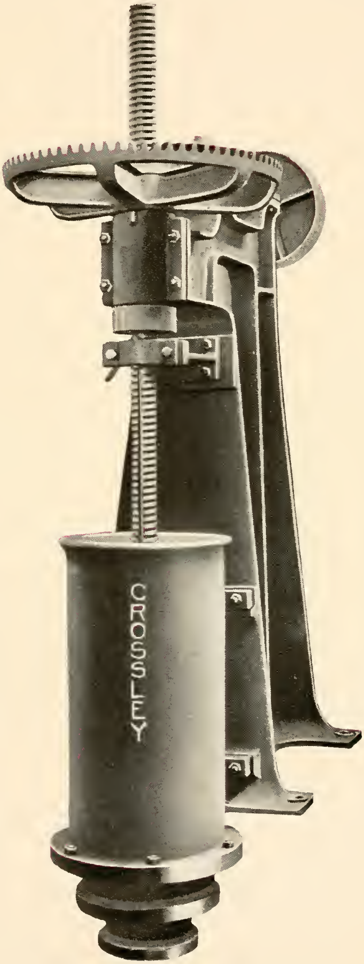
Pipe or Hollow Ware Machine

This machine was designed for the manufacture of earthenware pipe, chemical stoneware, or any other special hollow or solid tubes, etc., and is very rapid in operation. It is of very heavy construction and is capable of standing the strain which a machine of this character is subjected.

When requesting prices on this machine, kindly submit sketch giving full dimensions and shape of piece.

Floor Space	Extreme Height From Platform	H. P.	Weight	Export Weight	Speed of Cone Pulley
6 x 3 ft	10 ft. 6 in.	5	2,400 lbs.	2,900 lbs.	20 R. P. M.

Pipe or Hollow Ware Machine

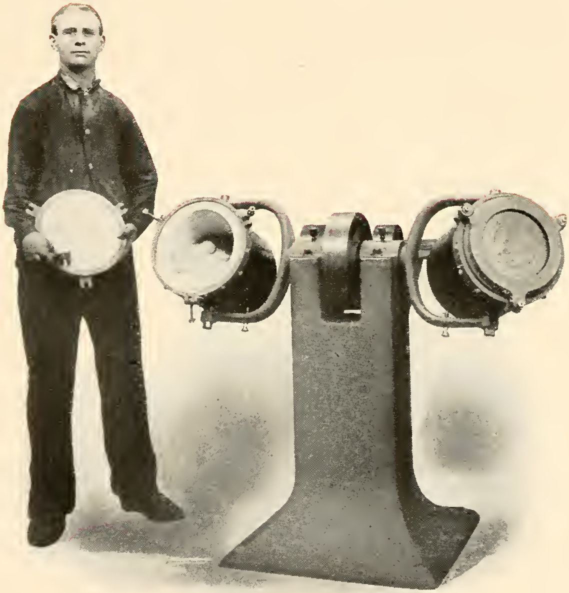


No. 0 Ball Mill

This half-tone cut shows our improved ball mill, which fills a long-felt want in potteries, tile works, laboratories, drug and chemical factories. The left cylinder in the cut has the lid off ready to charge, and the right cylinder discharging. It is a very simple and easily-operated machine. The cylinders work on trunnions and are lined with porcelain, which is tightly sulphured in the iron case. The lids are also porcelain, having a thick rubber washer all around the outside flange, thus making the porcelain cylinders perfectly air and water tight. This machine is very substantially built throughout, the stand being made in one casting. Its dimensions are as follows:

Length of cylinders (inside)	11¼ in.
Diameter of cylinders (inside)	9½ in.
Diameter of driving pulley	6½ in.
Speed of driving pulley	114 r. p. m.
Height, over all	3½ ft.
Floor space required	3 x 4 ft.
Capacity, each cylinder	4 gals.
Weight of machine	600 lbs.
Export weight	800 lbs.

No. 0 Ball Mill



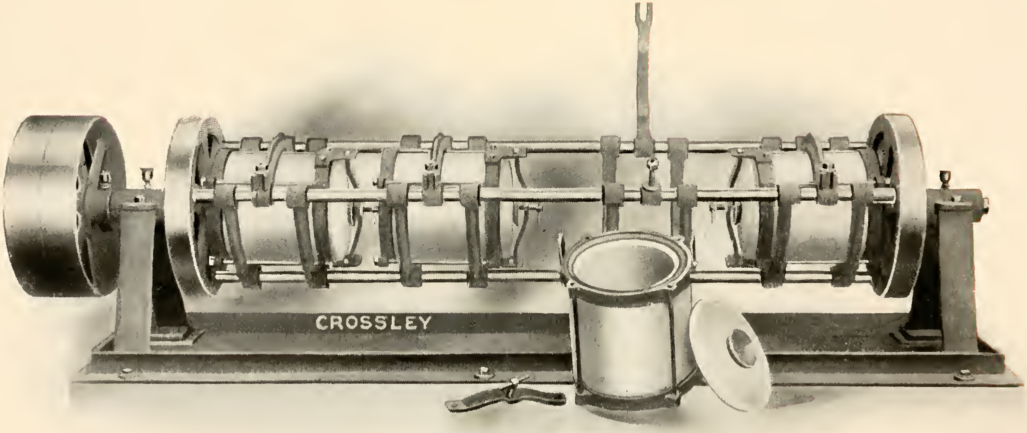
No. 00 Ball Mill

This cut shows our four-jar ball or pebble mill. The clamping device is so arranged that by loosening a thumb-screw the jar can easily be taken out and discharged. It is made with any number of jars desired. The materials used in construction and the workmanship are the best. The jars are made of the finest and hardest porcelain. This mill is used extensively for grinding drugs, colors, glazes and other liquid and solid materials. The dimensions of this machine are as follows:

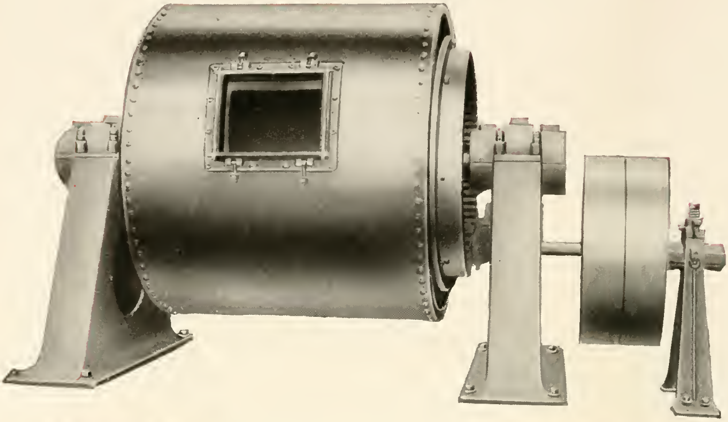
Length of porcelain jars (inside)	8½ in.
Diameter of porcelain jars (inside)	7½ in.
Diameter of driving pulley	15 in.
Speed of driving pulley, about	60 revolutions
Height of machine, over all	20 in.
Floor space required	1½ x 6 ft.
Capacity, each cylinder	1½ gallons

The weight, floor space and other data are in proportion to the number of jars desired.

No. 00 Ball Mill



Ball Mills or Grinding Cylinders



STYLE "A" OR PLAIN SOLID
BEARING TYPE

Our ball mills or grinding cylinders are used for the grinding of flint, spar, color, glaze, sand or any other material of a like nature which is required to be pulverized or ground and which can be reduced to any degree of fineness in these mills.

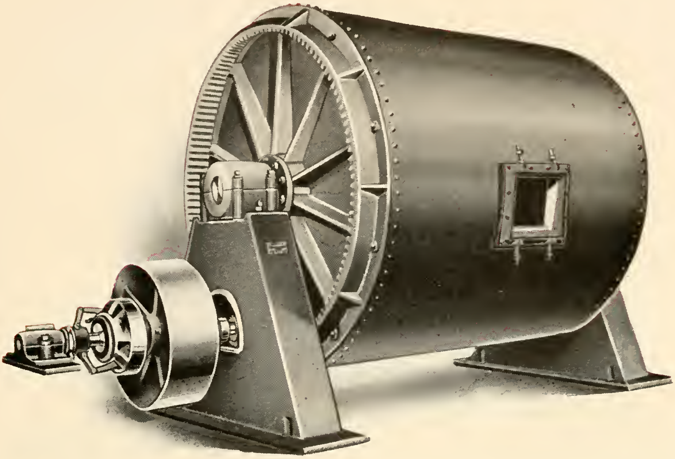
Note the length of bearings and rigidity of construction.

Our style "A" or plain solid bearing type mills are made in three sizes, viz., 2 ft., 3 ft. 6 in., and 4 ft. 6 in. These mills are lined with silex lining, which is the hardest and best cutting substance known, or can be lined with hickory or porcelain blocks.

When ordering state the kind of lining, also whether friction clutch or tight and loose pulley drive is wanted.

Size Style "A"	Weight	Export Weight	Height	Pinion Shaft Speed	Floor Space	Pulley
2 ft.	1,244 lbs.	1,434 lbs.	3½ ft.	45	3 ft. x 6	24 x 4 in.
3 ft. 6 in.	5,500 lbs.	5,800 lbs.	4½ ft.	125	4 x 7½ ft.	18 x 4 in.
4 ft. 6 in.	7,070 lbs.	7,500 lbs.	6½ ft.	125	5 x 11 ft.	18 x 6 in.
5 ft. 6 in.	9,000 lbs.	9,750 lbs.	7½ ft.	135	6 x 12½ ft.	24 x 8 in.

Ball Mills or Grinding Cylinders



STYLE "B" OR HARDENED AND GROUND ROLLER BEARING TYPE

The above cut shows our style "B" hardened and ground roller bearing type ball or grinding cylinder.

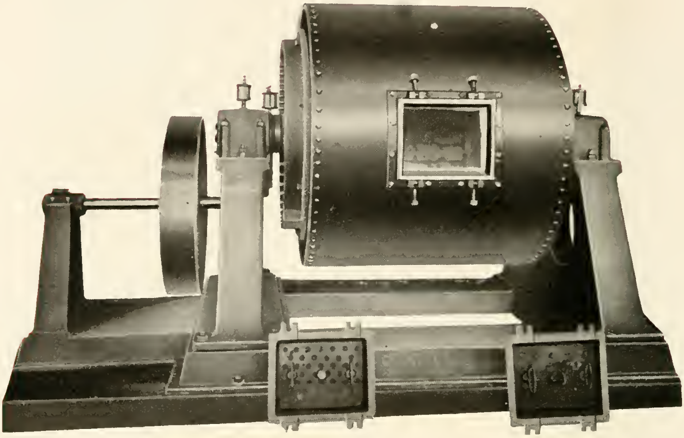
This type mill is made in two sizes, viz., 4 ft. 6 in., and 6 ft. 8 in., and is lined with silex, hickory or porcelain, whichever is preferred. The driving pulley is fitted with a friction clutch, which enables the operator to start and stop the mill in any position desired.

You will also note that this style "B" mill is fitted with hardened and ground roller bearings enclosed in a dust-proof casing, which not only means a large saving in fuel and power, but reduces the cost of upkeep to a minimum.

Size Style "B"	Weight	Export Weight	Height	Pinion Shaft Speed	Floor Space	Pulley	H. P.
4 ft. 6 in.	7,500 lbs.	7,800 lbs.	6 ft. 6 in.	125	5 x 11 ft.	18 x 6 in.	7½
6 ft. 8 in.	17,900 lbs.	18,900 lbs.	8 ft.	150	8 x 15 ft.	30 x 10 in.	20

Ball Mill

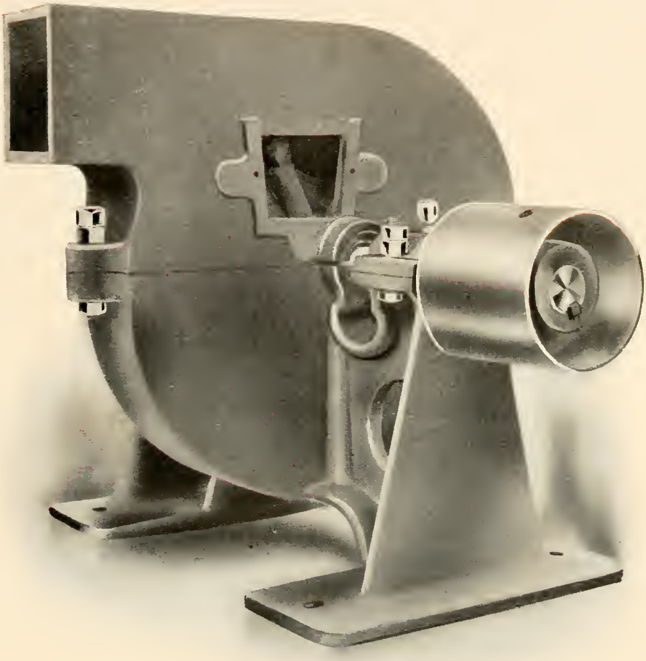
HARDENED AND GROUND ROLLER BEARING TYPE



The above cut shows our 4-foot 6-inch ball mill fitted with hardened and ground roller bearings and fitted on a base plate so as to make it a self-contained proposition. By the use of a base plate it is impossible for the machine to ever get out of alignment, and insures you that you will always have a machine that is consuming the minimum horse power necessary to operate same. A motor can be placed on base plate for gear or chain drive and the machine can be placed on the floor without any foundations whatever.

Pulverizer

STYLE "B"

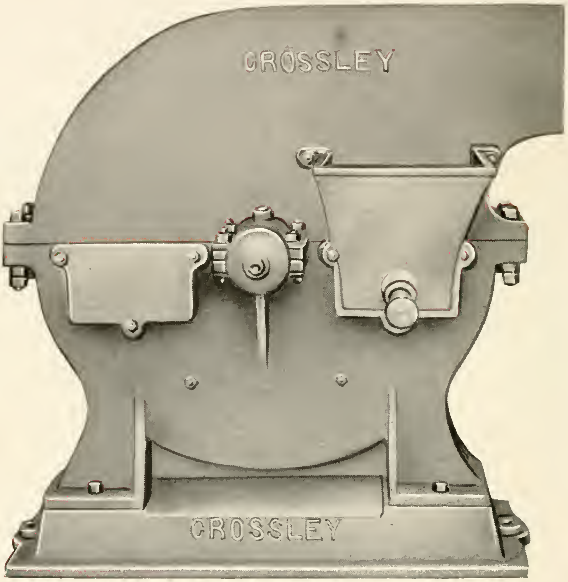


Our pulverizer is used for pulverizing clay or grinding it to a fine powder. In the iron case are cast-steel beater-arms, which revolve at a very high speed, thus reducing the chunks of clay to a dust. This machine is substantially built and is especially adapted to tile and electrical porcelain manufacturers, where the clay to be pressed must be in dust form. It is built in two sizes.

Size	Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity Per 10 Hours	H. P.
No. 1	1½ ft.	170 lbs.	250 lbs.	1½ x 2 ft.	4 x 4 in.	2,250	2 to 5 tons	5
No. 2	2½ ft.	500 lbs.	650 lbs.	2 x 3 ft.	7½ x 7½ in.	2,100	8 to 10 tons	10

Pulverizer

STYLE "A"



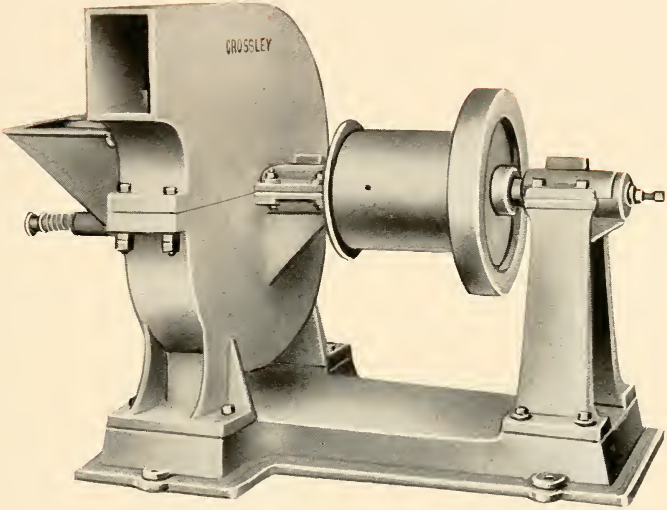
SIDE VIEW

This type of pulverizer made in two sizes only

Size	Weight	Export Weight	Height	Floor Space	Speed	Pulley	H. P.
36 in.	1,900 lbs.	2,300 lbs.	4 ft.	4½ x 4½ ft.	1,200	12 x 12 in.	12
48 in.	2,600 lbs.	3,000 lbs.	4 ft 8 in.	4½ x 7 ft.	1,200	14 x 14 in.	15

Pulverizer

STYLE "A"



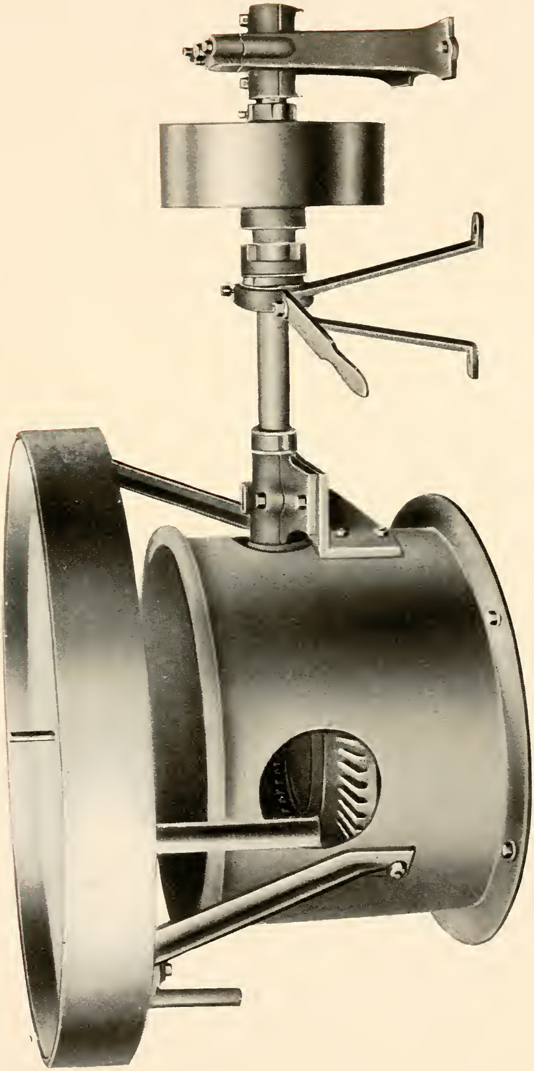
FRONT VIEW

This pulverizer or dust blower is designed to meet the requirements of factories using a large quantity of material. This machine is made of the very best material and workmanship, equipped with large bearings and end adjustment. The spider is made of cast steel to which is fitted crucible steel plates, which are firmly bolted to spider. A large pulley and balance wheel is also supplied with this machine, which insures a perfect balanced running mill.

Surface Grinder

The greatest advantage in our surface grinder over all other makes on the market is the fact that the revolving table, on becoming worn, or the surface becoming irregular, it is not necessary to go to the great expense of having it faced off again. We have provided for this by having a light plate bolted to the table, which can be replaced when it is worn, at a very small expense. The gearing is enclosed in the iron base of the machine, thus keeping all sand and grit from the working parts. It is used for grinding the surfaces of pieces of ware by means of the action of sand and water. There is a trough running around the table, which catches the sand and water as it runs off the table and delivers it to a receptacle placed under the outlet pipe. We build these machines in three sizes, of the following dimensions:

Size	Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.
3 ft.	3 ft.	1,000 lbs.	1,400 lbs.	5 x 6 ft.	6 x 18 in.	150	Depends on size of ware	2½
4 ft.	3 ft.	1,250 lbs.	1,650 lbs.	5 x 6 ft.	6 x 18 in.	150		3
6 ft.	3 ft.	3,500 lbs.	3,900 lbs.	7 x 7 ft.	8 x 24 in	95	Depends on size of ware	4½



Surface Grinder

Sand Grinder

STYLE "B"

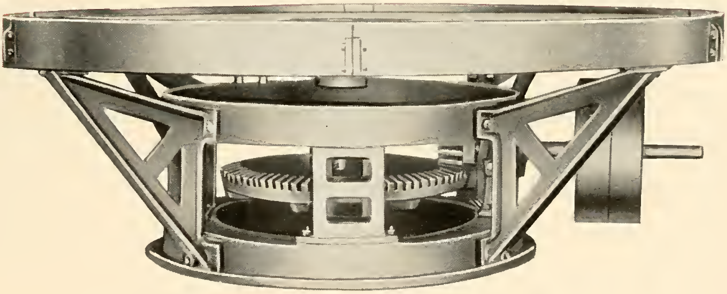
A few advantages of this machine over any other make for this class of work are first the grinding plates and mud ring are made in six sections to facilitate the handling of same when necessary to true up face of plate. The edges of these plates are machined, thereby ensuring a perfectly tight joint and are securely bolted to a ready ribbed spider which is supported by a shaft 6½ inches in diameter with long bearings that are adjustable to wear. The bottom step bearing is made of the latest improved box type and is so arranged that you can readily remove the cast steel thrust pin which is 3½ inches in diameter without dismantling machine. This type of thrust bearing reduces the friction to a minimum. An inspection of this grinder will convince the most skeptical of the superiority of this make over any other. This grinder is made in the following sizes:

Size	Height	Weight	Export Weight	Floor Space
8 in.	3 in.	6,000 lbs.	6,800 lbs.	9 x 9 ft.
10 in.	3 in.	14,000 lbs.	15,000 lbs.	11 x 11 ft.

Driving Pulley	Speed Runner Wt.	Capacity	H. P.
10 x 32 in.	60-Rev.	Depends on size of ware	10
10 x 30 in.	50-Rev.	Depends on size of ware	10-15

Our Improved 8 and 10 Feet Surface Grinder

STYLE "B"



Our Improved 42-Inch Horizontal Carborundum Grinder

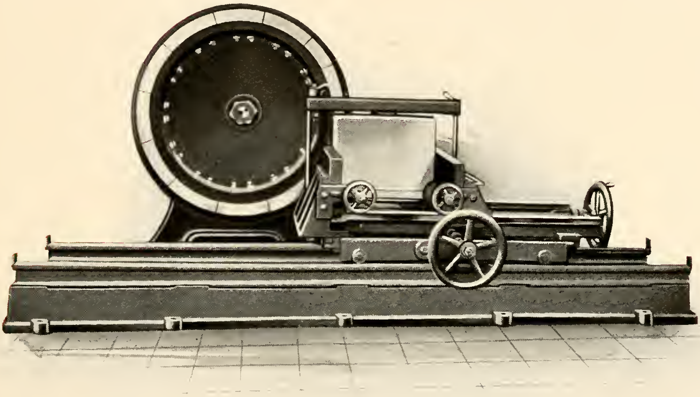
This machine was especially designed to meet the long-felt want of the sanitary ware manufacturer for a machine that would decrease the expense of production and it is fast replacing the old-style disc or sand grinder by its increase both in quantity and quality of work produced and is a great saver in power.

The piece of ware to be ground is held in a vise that is a part of a roller-bearing traveling carriage, which is propelled past the cutting edge of wheel, thereby insuring a perfectly straight face, which is almost impossible to get with any other type of grinder. Cut shows tank in position ready to be ground.

We make this machine either with a single or double grinding side, as desired.

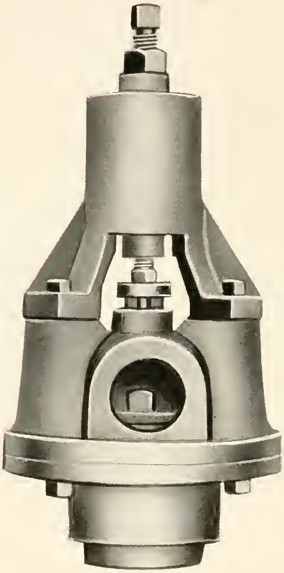
Further information, if desired, in regard to size, etc., on application.

Our Improved 42-Inch Horizontal Carborundum Grinder



Class	Weight	Export Weight	Floor Space	Speed	Pulley	H. P.
Double Machine	11,450 lbs.	12,000 lbs.	10½ x 12 ft.	375	20 x 8½ in.	15
Single Machine	7,000 lbs.	7,500 lbs.	12 x 6½ ft.	375	20 x 8½ in.	10

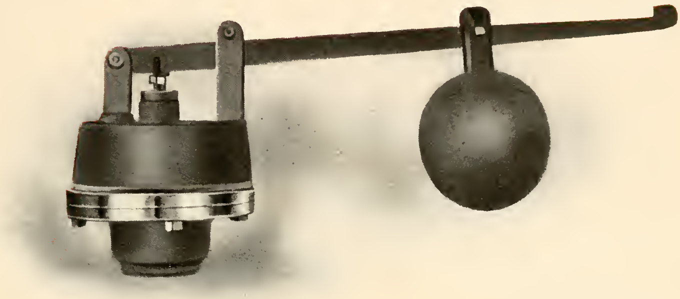
Our Improved Spring Overflow and Relief Valve



PARTS CARRIED IN STOCK.
MADE IN TWO SIZES ONLY, "A" and "B"

Size	Weight	Export Weight	Size of Receiving and Discharge Pipes	Size of Brass Valve	Pressure
A	95 lbs.	150 lbs.	2 in.	2 in. dia.	80 to 100
B	100 lbs.	150 lbs.	2 in.	2⅝ in. dia.	80 to 100

Over-Flow or Relief Valve



This safety valve is especially designed for clay or heavy and gritty substances. The plunger and rings are made of brass with rubber seats. It is used in connection with our clay pumps for regulating the pressure of the liquid clay in the filter presses.

We make these safety valves in three sizes, of the following dimensions:

Size	Weight	Export Weight	Size of Receiving and Discharge Pipes	Range of Pressure
No. 1	25 lbs.	50 lbs.	¾ in. pipe	5 to 80 lbs.
No. 2	35 lbs.	100 lbs.	1½ in. pipe	10 to 80 lbs.
No. 3	85 lbs.	150 lbs.	2 in. pipe	20 to 80 lbs.

Hand Whirlers

The hand whirlers shown on opposite page are made with the best materials and workmanship, and will be found to be well balanced and easily revolved. The step at bottom of spindle can be adjusted to allow for any wear that might occur in the spindle.

The bench whirler is fastened to a bench by means of wood screws, which hold it perfectly rigid and allow it to work freely.

The sagger maker's whirler is, as its name implies, used for making saggers and other large articles, which require a very heavy and substantially built machine.

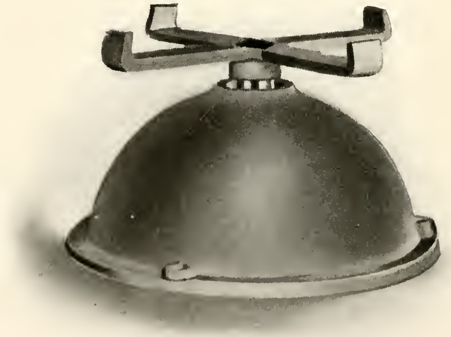
The portable bench whirler is used on the bench, and can be moved from place to place, as required, being self-contained and requiring no outside support for the spindle.

The bench whirler is built in two sizes, No. 1 and No. 2. The weight of No. 1 is 20 pounds, and its length over all is 20 inches. The weight of No. 2 is 30 pounds, and its length over all is 24 inches.

The sagger maker's whirler weighs 100 pounds, and its height is 30 inches, diameter of table is 23 inches.

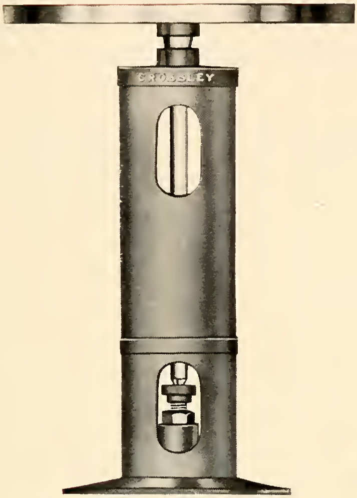
The portable bench whirler weighs 23 pounds, and its height is 6 inches, diameter of base is 10 inches.

These whirlers are complete in every particular, and prices will be furnished upon application.

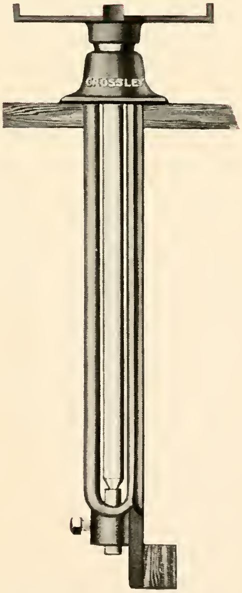


PORTABLE BENCH WHIRLER

Hand Whirlers



SAGGER MAKER'S WHIRLER



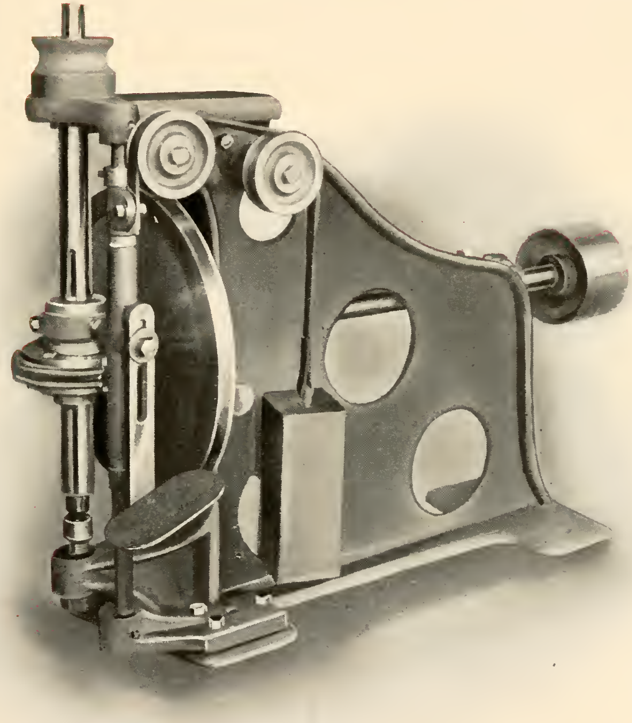
BENCH WHIRLER

Potters' Throwing Wheel or Variable Speed Jigger

Our thrower's wheel is used for making cups, oyster bowls, and pieces which are usually made in this manner. It is also used extensively by emery wheel manufacturers. The speed-changing arrangement is very sensitive, requiring a very slight pressure of the foot to change the speed of the spindle, which feature is appreciated by the operator. There are a number of valuable improvements in this machine over the old-style throwing wheels, which will be apparent upon investigation. The dimensions are as follows:

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	H. P.
3 ft.	475 lbs.	525 lbs.	1½ x 3 ft.	4½ x 9 in.	250	1½

Potters' Throwing Wheel or Variable Speed Jigger



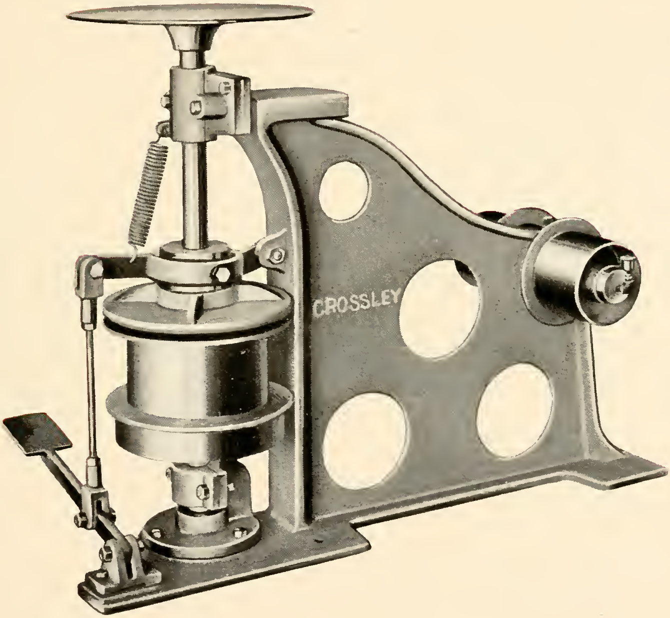
Heavy Duty Throwers' Wheel

The thrower's wheel illustrated herewith is especially adapted for the throwing of heavy pieces and the variable speed is obtained by releasing the friction clutch which is controlled by foot lever. The bottom bearing is fitted with a special ball bearing thrust which reduces the power consumed to a minimum, and is built of the very best material and workmanship throughout.

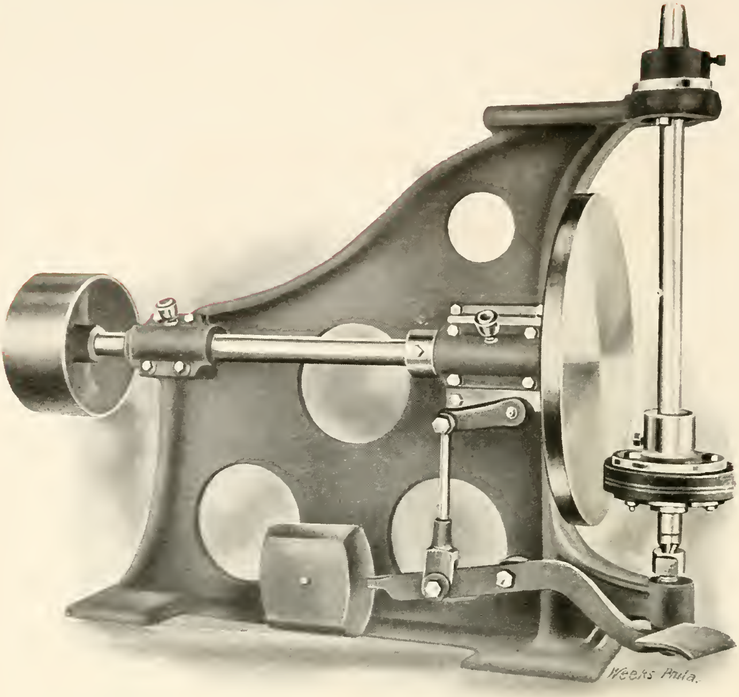
The dimensions are as follows:

Height	Weight	Export Weight	Floor Space	Speed	H. P.
3 ft.	550 lbs.	625 lbs.	1½ x 3½ ft.	To suit	1½

Heavy Duty Throwers' Wheel



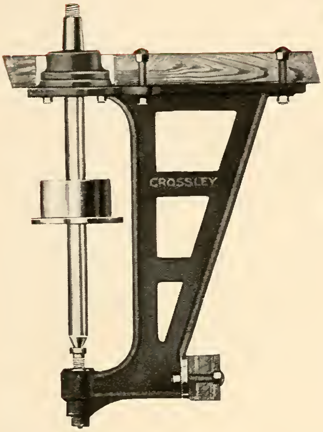
No. 1 Jigger or Potters' Wheel

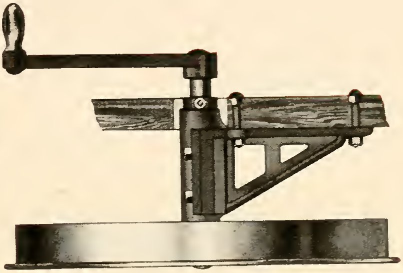


The jigger shown on this page is generally used in connection with one of our pull-downs, for making articles of clay formed by means of a profile or tool operated by the pull-down. It is a very well built and substantial machine, requiring very little expense to keep in repair, having few wearing parts. The advantages of this machine, as compared with other makes on the market, will be apparent to the operator. We can furnish any style or shape of head for this jigger to make any desired article. The dimensions are as follows:

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	H. P.
3 ft.	400 lbs.	600 lbs.	1½ x 3 ft.	4½ x 9 in.	250	1½

Hand Jigger

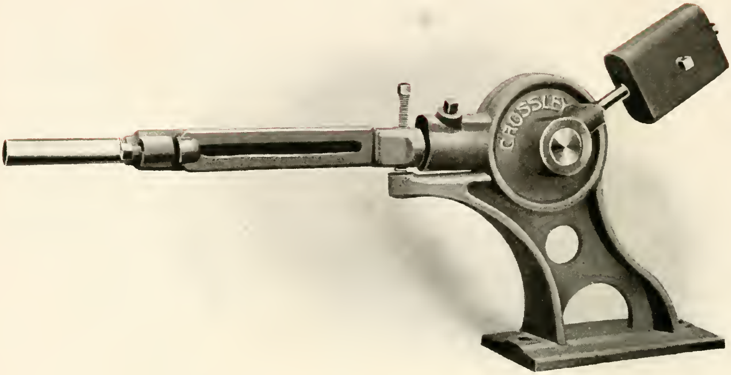




This illustration shows our hand jigger, which is used where power is not available or when delicate work is being performed, requiring that the operator should use the utmost care. The spindle is very well balanced and runs absolutely true. This machine is very often used by mold-makers or others doing work of a similar character. It is fastened to a bench and operated by a boy or assistant by means of the hand-wheel or crank. We make this machine in one size only, of the following dimensions:

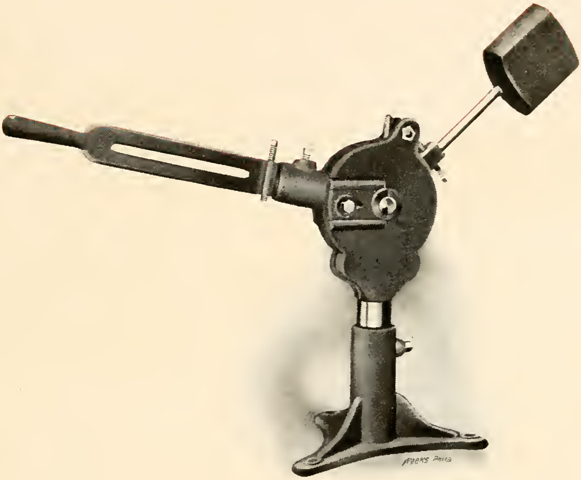
Height, over all, about 25 in.
Weight, about 125 lbs.

Nos. 1 and 2 Pull-Down



This pull-down is made in two sizes, No. 1 and No. 2. The No. 1 is used for making cups, saucers, etc., the No. 2 is used for plates, bowls, etc. It is a simple, durable and quick-acting machine, being perfectly balanced by means of the weight placed on back of machine. The set-screw on tool holder adjusts the depth of tool to suit the piece being made. The tool holders are interchangeable, thereby assuring uniformity of ware. These pull-downs can be furnished connected with jiggers when desired. The weight of No. 1 machine is about forty-five pounds, and the No. 2, sixty-six pounds.

No. 3 Pull-Down



Our No. 3 pull-down is used for making chambers, bowls, large basins, etc. It is very easily operated and quickly adjusted to make a wide range of work. It can be furnished with an interchangeable tool holder when desired. This machine can be attached to our standard jigger or be bolted to a bench. It is very well built and perfectly counterbalanced.

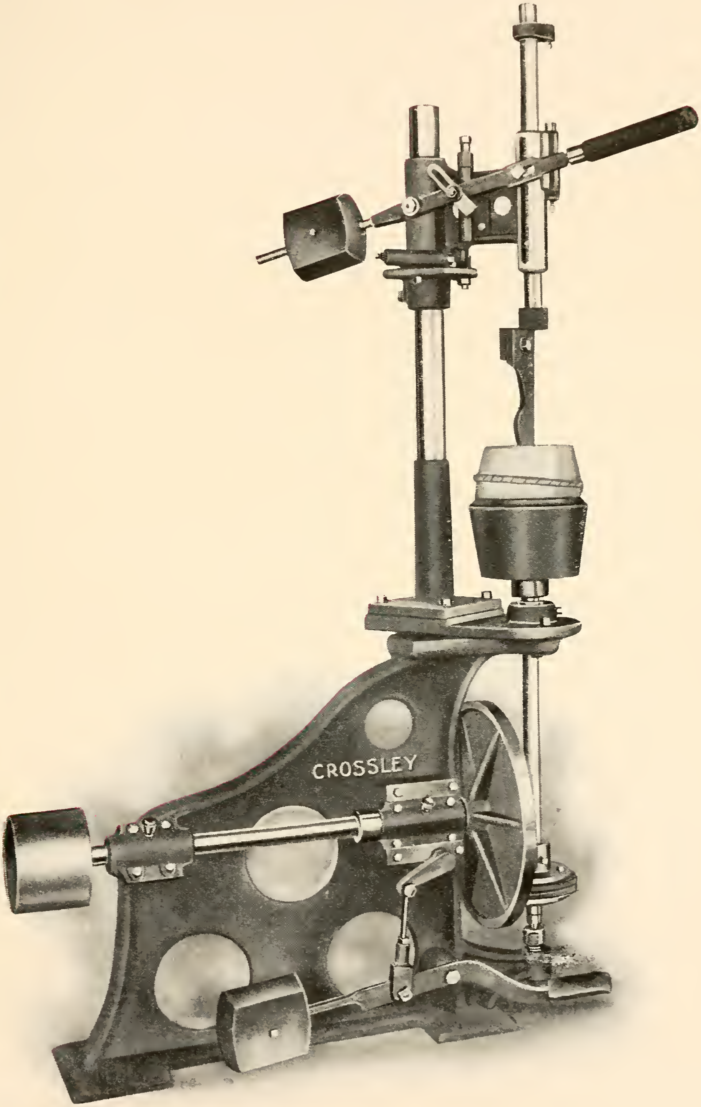
No. 4 Pull-Down and Jigger Combined

This cut shows our No. 4 pull-down and jigger combined, which is used for making articles with narrow neck. It is very quickly and easily operated. The stops are provided with a spring cushion, which arrests the profile just before it comes to a full stop, thus preventing any tearing or jamming of the clay in the mold. There are other great improvements in this machine, which will be apparent at a glance.

Height	Weight	Export Weight	Floor Space
6½ ft.	550 lbs.	700 lbs.	3 x 4 ft.

Driving Pulley	Speed	Capacity	H. P.
4½ x 7 in.	250	Depends on size of articles	2

No. 4 Pull-Down and Jigger Combined

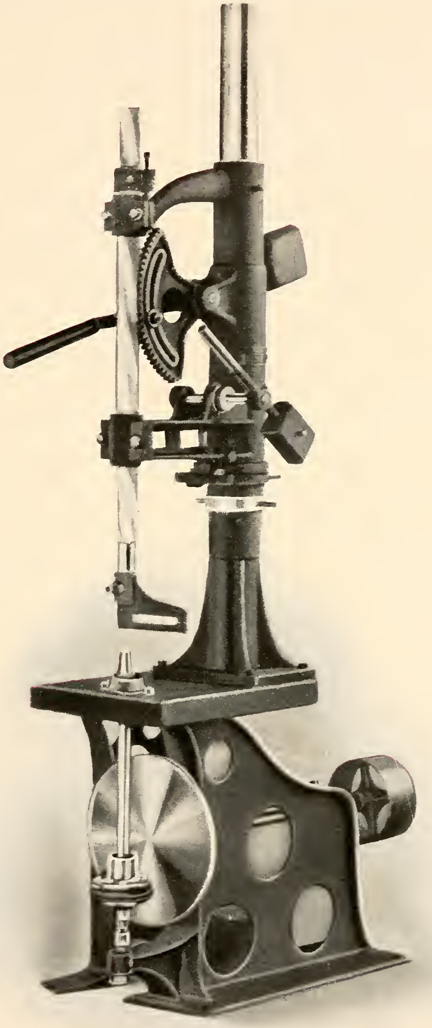


No. 7 Pull-Down and Jigger Combined

This pull-down is self-contained and is used for making cuspidors, jardinieres and various kinds of narrow-neck bellied work. We furnish this pull-down either separately or combined with jigger. This machine is built in the best manner possible. In making a piece of ware, and after having the mold placed in position on the jigger head and the profile attached to the tool holder, the handle on left side of machine is pulled down until the profile reaches the bottom of the piece being made; then the right lever is pulled down toward the operator, which, being connected to the vertical column by cut-mitre gears, causes the profile to swing around and make the belly in the piece of ware. This machine is made in one size only, of the following dimensions:

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Capacity	H. P.
7 ft.	About 750 lbs.	1,000 lbs.	3 x 4 ft.	4½ x 9 in.	240	Depends on size of articles	2

No. 7 Pull-Down and Jigger Combined



No. 8 Pull-Down and Jigger Combined

STYLE "D"

This machine was designed for making jardinieres and pieces of similar proportions—will make either inside or outside work. Conveniently arranged adjustments make it a practical and accurate machine, which can be operated with ease and rapidity. It is being successfully operated in a number of the largest potteries in this country. It combines all the principles of our three best pull-downs, having a vertical, a horizontal and a radial movement.

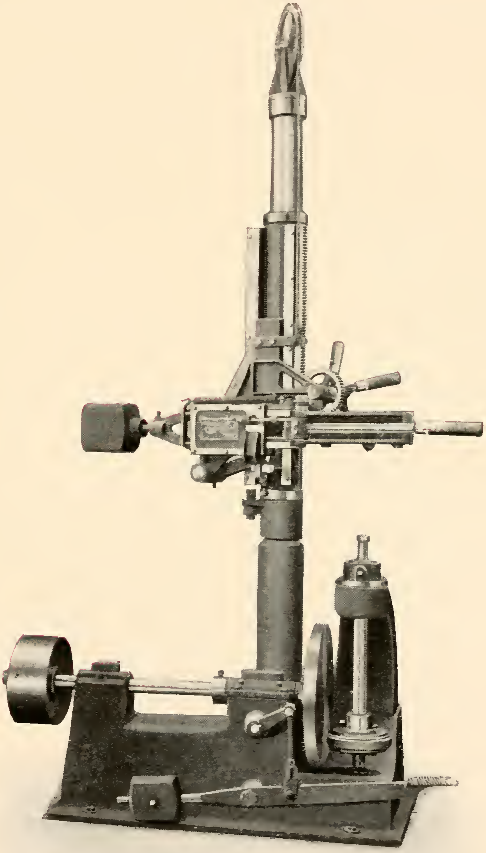
It will make bellied jardinieres up to 15 inches in diameter and 15 inches high, and is well adapted to making complete toilet sets. It will also make either inside or outside work.

Size	Height	Weight	Export Weight	Floor Space
D	7 ft.	850 lbs.	1,350 lbs.	3 x 4 ft.

Vertical Movement	Horizontal Movement	Driving Pulley	Speed	H. P.
15 in.	3 in.	4 x 9 in.	250	5

No. 8 Pull-Down and Jigger Combined

STYLE "D"



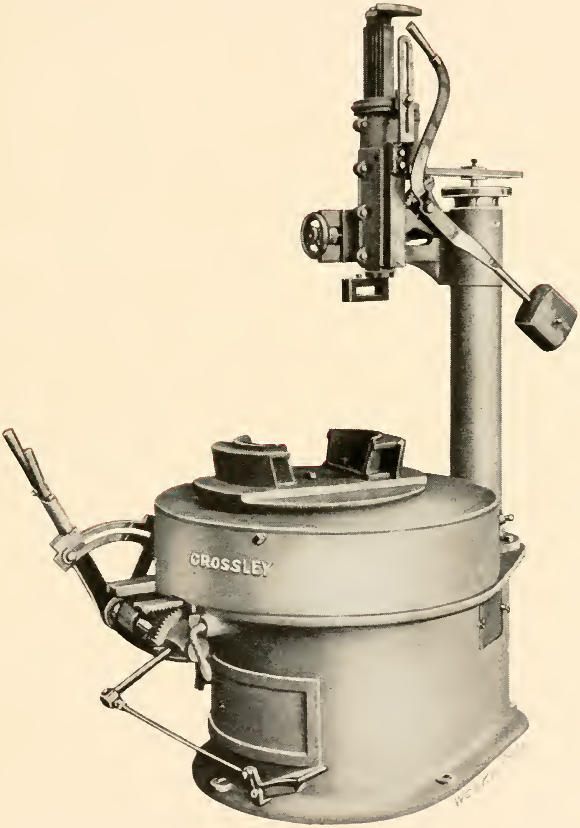
Oval Jigger

This machine is used for the making of Oval Dishes such as meat platters, bakers, etc., and will make them complete with the rolled edge and the deep foot on the bottom of plate, as shown in cut. It is the only machine on the market that will do this class of work successfully. This machine has a capacity of making meat platters from 6 inches up to 16 inches, and bakers from 4 inches up. It is very simple and rapid in operation and built of the Crossley Standard throughout.

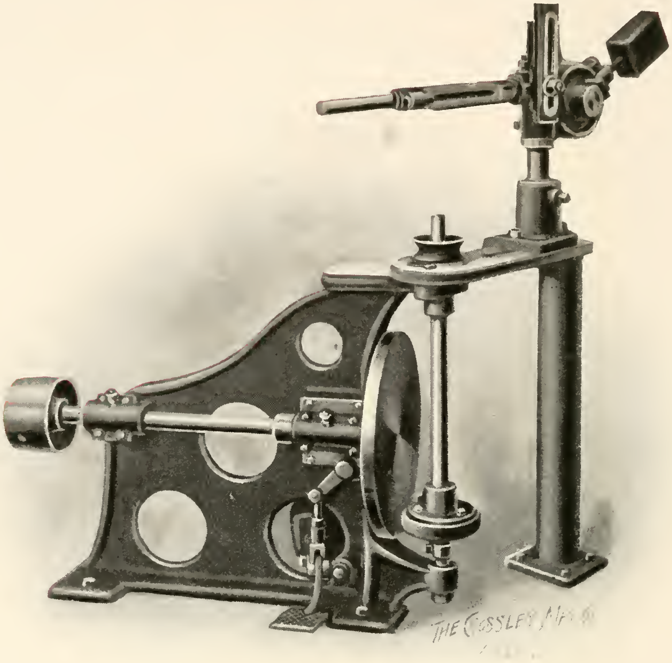
Weights, etc., are as follows:

Height	Weight	Export Weight	Floor Space	Size of Pulley	Speed	H. P.
6 ft. 10 in.	2500	2800	4½ x 6½ ft.	18 in. x 6 in.	90	3

Oval Jigger



No. 5 Pull-Down and Jigger Combined

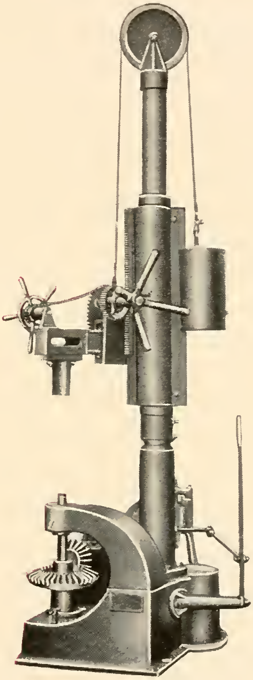


This cut shows our No. 5 adjustable radius pull-down and jigger combined, which is used for making articles with a rolled edge, such as plates, cups, saucers, bowls, butters and other articles of this character. This is the only pull-down on the market which will make rolled edge as well as plain work. It is very substantially built and easily operated, being well balanced. The dimensions are as follows:

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	From Center of Spindle to Column	Top of Spindle to Arm	H. P.
4½ ft.	600 lbs.	800 lbs.	3 x 4 ft.	4½ x 9 in.	250	14½ in.	16½ in.	2

No. 8 Crucible Pull-Down and Jig Combined

STYLE "A"

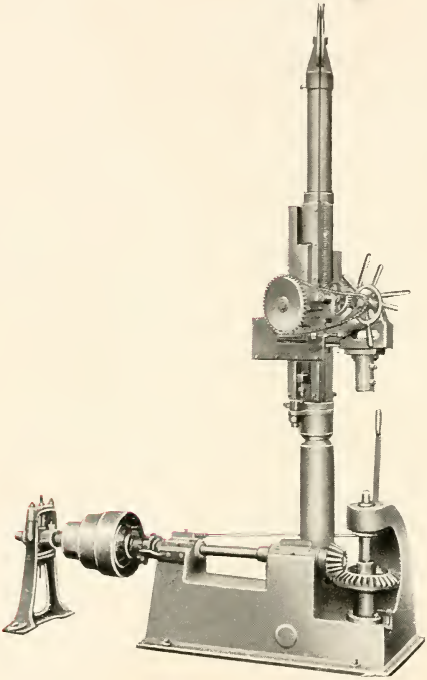


FRONT VIEW

Size	Height	Weight	Export Weight	Floor Space	Pulleys	Speed	Capacity	H. P.
A	9½ ft.	2,500 lbs.	3,000 lbs.	3 x 4 ft.	Cone 7 in. 10 in. 12 in. dia.	Three Speeds	10 in. dia. 15 in. high	5

No. 8 Crucible Pull-Down and Jigger Combined

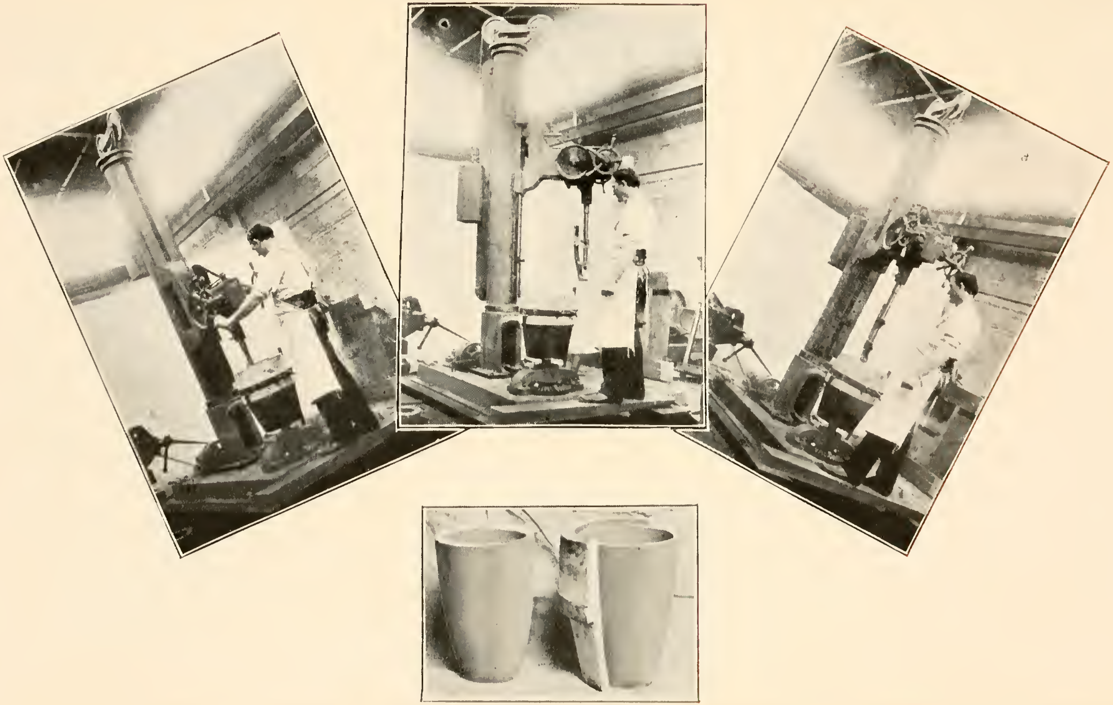
STYLE "A"



SIDE VIEW

This jigger and pull-down was designed for making crucibles up to 15 inches diameter by 15 inches high.

Method of Jiggering Crucibles



Pull-Down and Jigger Combined

CRUCIBLE MACHINE

STYLE "B"

This machine is designed and built for jiggering and forming large pieces, such as crucibles, retorts, etc.

Size No. 8B machine will make articles up to 15 inches in diameter and 17 inches high.

Size No. 9B machine will make pieces from 10 inches in diameter and 15 inches high, up to 30 inches in diameter and 30 inches high.

In starting to operate the machine, the vertical sliding head should be swung around to the right, having the profile sufficiently high to clear the top of the mold. The mold being placed in the jigger head, and the ball of clay thrown into the mold, the head is then swung around against a stop, this stop being adjusted so that the face of the profile is always in the center of the spindle; the machine is then started by means of the friction-clutch lever. The profile or tool is then brought down into the mold by turning the right-hand wheel. By turning the left-hand wheel the profile forces the clay against the interior of the mold. The piece being formed, the above operation is reversed, and the mold together with the piece made, is removed.

The machine is fastened or bolted to the floor. The pull-down is firmly fastened to the jigger base, making it a compact and rigid machine.

The speed is regulated by a cone-friction pulley, which is controlled by a lever attachment conveniently arranged.

The adjustable tool holder and arm are evenly balanced by a weight, and slides up and down the vertical column with ease. When a piece is finished, the base of the sleeve being fitted with ball bearings, a slight push with the hand will swing the arm around and make ample room for taking out and placing the mold.

Cut of style "B" machine is shown on following page.

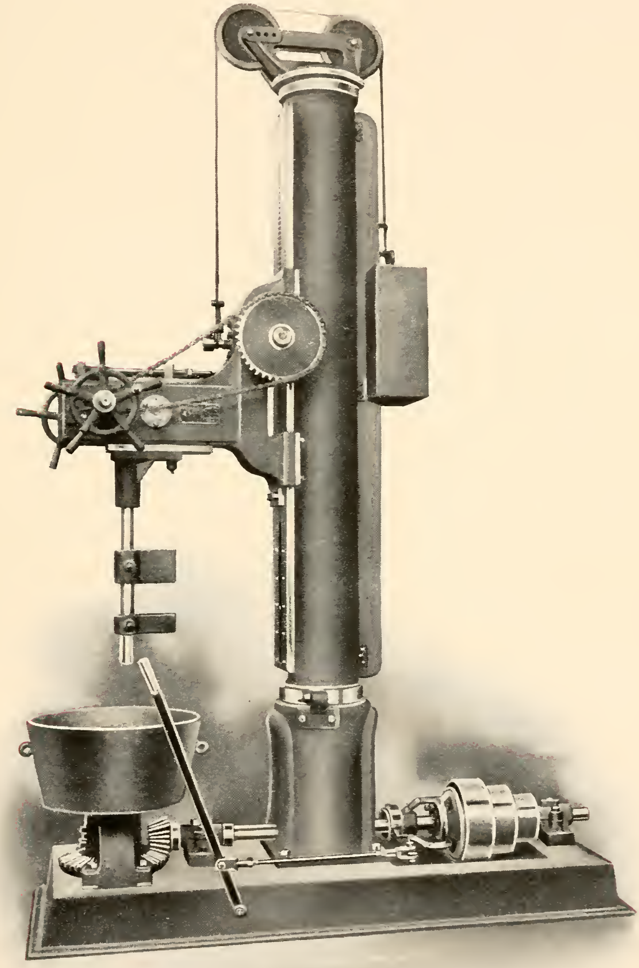
We have this machine in very successful operation in a number of the largest steel and crucible plants. It is made in two sizes, of the following dimensions:

Size	Height ft.	Weight lbs.	Export Weight lbs.	Floor Space ft.	Pulleys	Speed	Capacity	H. P.
8B	9½	2,500	2,850	2½ x 6½	4 in. face. 7, 10, 12 in. dia.	Three Speeds	10 in. dia. 15 in. high	5
9B	12	3,800	4,350	3 x 7	4 in. face 7, 10, 12 in. dia.	Three Speeds	30 in. dia. 30 in. high	8

Pull-Down and Jigger Combined

CRUCIBLE MACHINE

STYLE "B"



Light Type Jigger

STYLE "C"

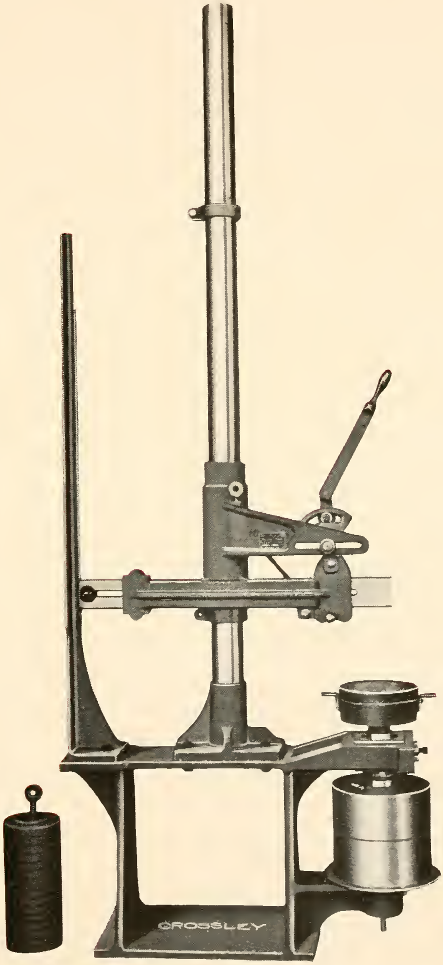
This jigger is adapted for making of hollow-ware or crucibles up to No. 60, and is very rapid in operation, also quickly adjusted to the different size pieces that can be made on the machine. The sliding arm is equally balanced by the use of a counter weight.

The floor space, etc., are as follows:

Height	Weight	Export Weight	Floor Space	Pulley	Speed	H. P.
9½ ft.	1,250 lbs.	1,450 lbs.	4 x 1½ ft.	12 x 5 in.	To suit	3

Light Type Jigger

STYLE "C"



Crucible Mixer

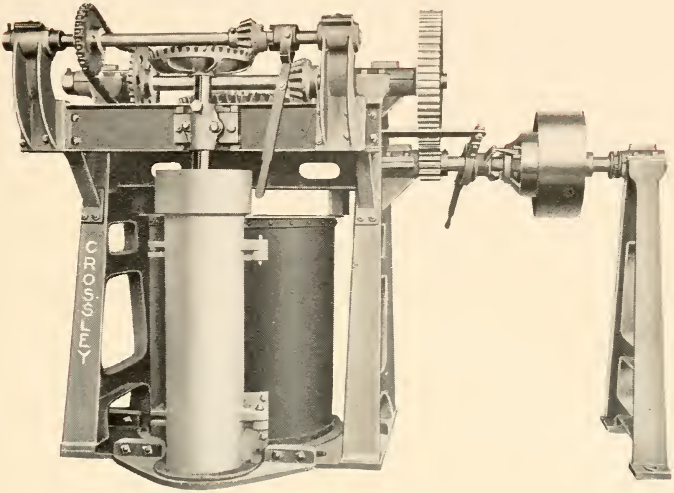
The crucible mixers as shown in cut are made for the mixing of crucible bodies and the amalgamation of sagger clays, etc. It is so arranged that when the clay is put in the top of the machine it is thoroughly mixed by special arranged knives, thence the material is passed to the back of the machine where a conveyor catches it and carries it up the back and discharges same into the top of the tank again. This operation is carried on continually until the material is thoroughly mixed, then the sliding door is opened and the material discharged. This machine can be arranged for front or bottom discharge and is built in two sizes, the No. 1 or small size has a capacity of approximately 1,500 pounds of material per hour, and the large or No. 2 size has a capacity of 5,000 pounds per hour.

These machines are of very heavy construction throughout, with bevel steel gear and pinion, and the rest of the gearing is machine cut throughout. The wheels which drive the conveyor are made of steel and are machine cut and are fitted with a diamond roller chain. The vertical shaft is fitted with hardened and ground tool steel step bearing of the latest improved type. The horizontal main drive shaft is made of a special alloy-steel. The tank is fitted with a clean-out door which gives the operator ready access to inside of mixer, and the knives are bolted to the vertical shaft independently so that they can be readily replaced. The mill can be arranged for motor or friction clutch drive as desired.

The dimensions, etc., are as follows:

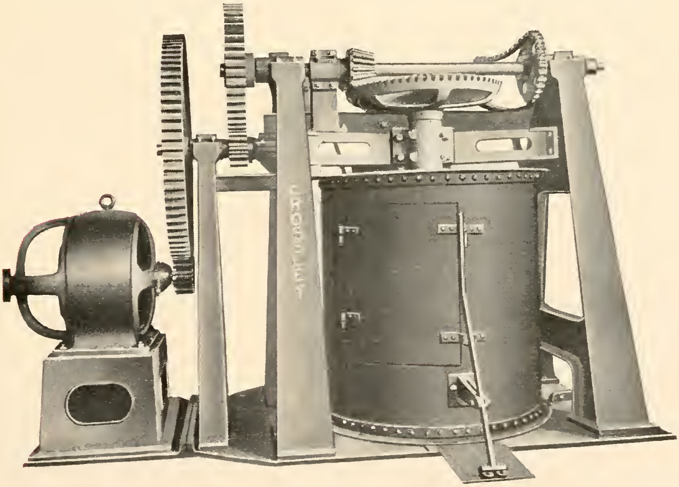
Size	Height	Floor Space	Weight	Export Weight	Speed	Pulley	H. P.	Capacity Per Hour
No. 1	7 ft.	6 x 10 ft.	7,000	7,600	150	24 x 8 in.	10	1,500 lbs.
No. 2	8½ ft.	8½ x 13 ft.	17,300	19,200	112	36 x 12 in.	25	5,000 lbs.

No. 1 Mixer Arranged for Belt Drive



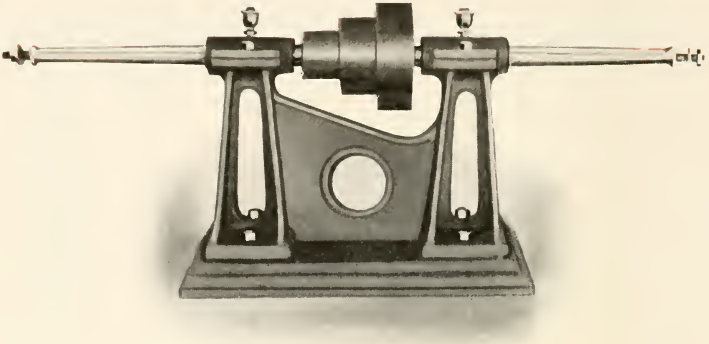
BACK VIEW

No. 2 Mixer Arranged for Motor Drive



FRONT VIEW

Polishing or Buffing Machine

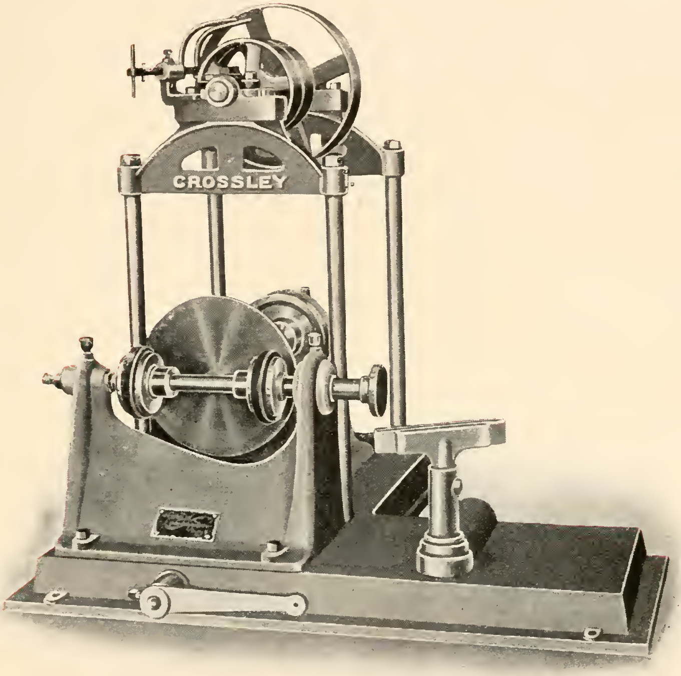


This machine is used for polishing or buffing articles, or grinding blisters and projections from ware. We furnish a counter-shaft with each machine. The spindle is perfectly balanced and revolves at a very high speed. It has a range of three speeds. The dimensions are as follows:

Height	Weight	Export Weight	Base	Speeds	H. P.
14 in.	85 lbs.	125 lbs.	12 x 18 in.	3 speeds 1,700 down	1

Turning Lathe for Bench

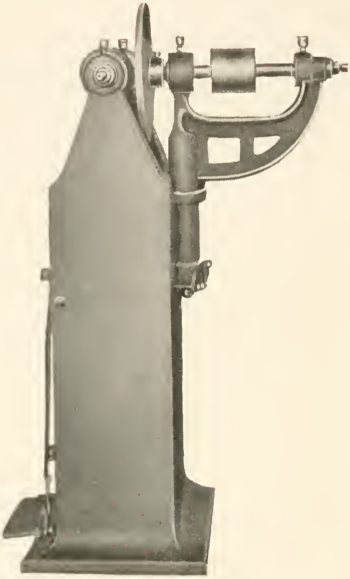
STYLE "A"



Our turning lathe for placing on a bench is self contained, with countershaft attached to the machine. It has a wide range of speeds, and by means of the treadle the direction of the spindle is instantly reversed from a forward to a backward motion.

Style	Height	Weight	Export Weight	Speed Counter	Size of Pulleys	Floor Space	H. P.
A	3½ ft.	400 lbs.	575 lbs.	400	2½ x 6¾ in.	3 x 3½ ft.	2

Simplex Turning Lathe

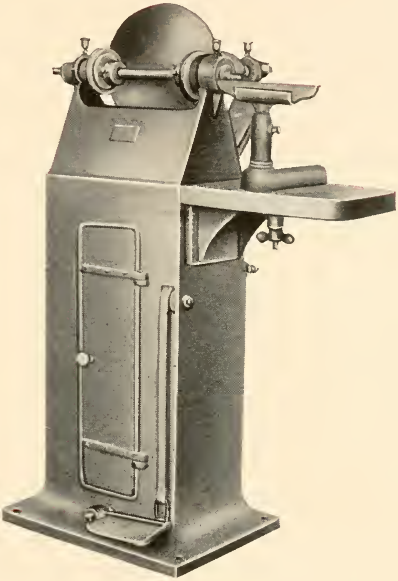


FRONT VIEW

This lathe is furnished with bracket bolted to frame or without as desired, and which is controlled to rotate in either direction by foot treadle.

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Swing	H. P.
4½ ft.	517 lbs.	650 lbs.	2 x 2½ ft.	4 x 4 in.	400	18 in.	1½

Simplex Turning Lathe

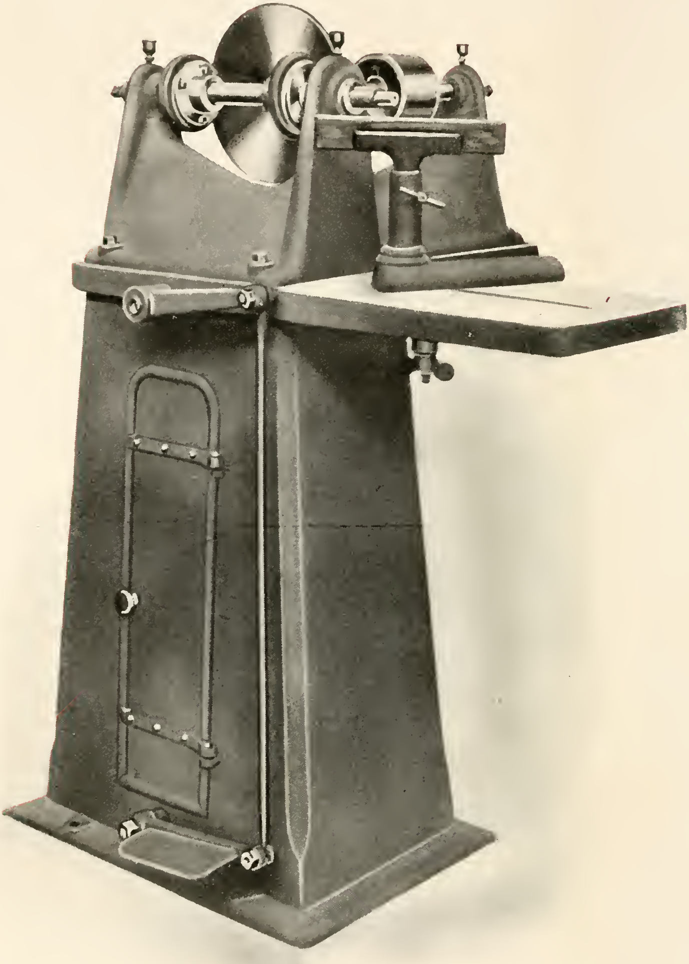


SIDE VIEW

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Swing	H. P.
4½ ft.	550 lbs.	700 lbs.	2 x 2½ ft.	4 x 4 in.	Variable	18 in.	1½

Turning Lathe with Cabinet

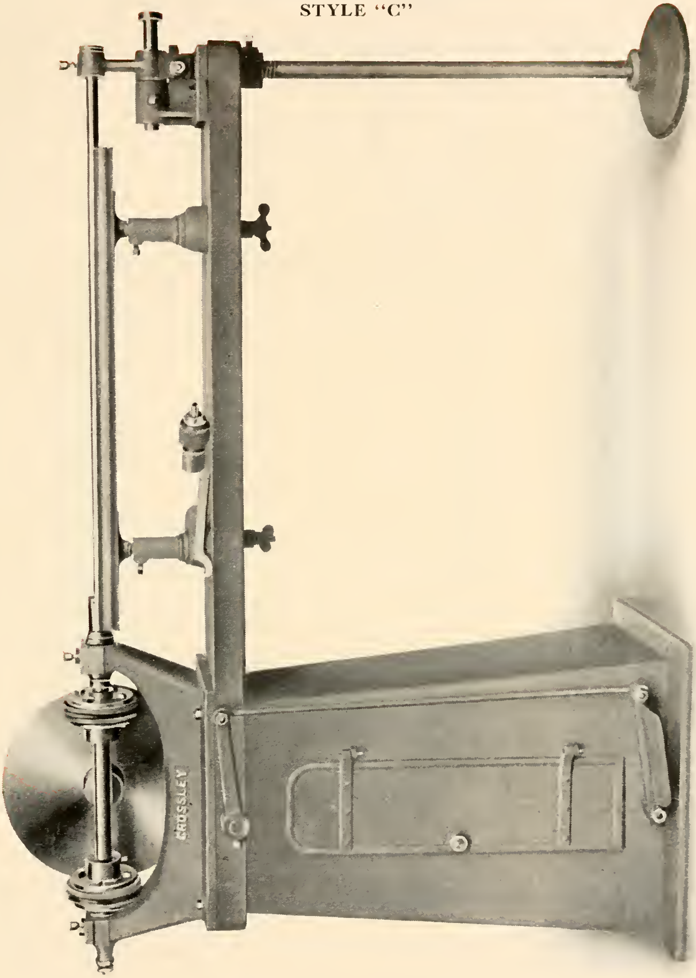
STYLE "B"



Style	Height	Weight	Export Weight	Speed Counter	Size of Pulleys	Floor Space	H. P.
B	4½ ft.	700 lbs.	900 lbs.	400	3 x 6 in.	2 x 4½ ft.	2

Turning Lathe

STYLE "C"

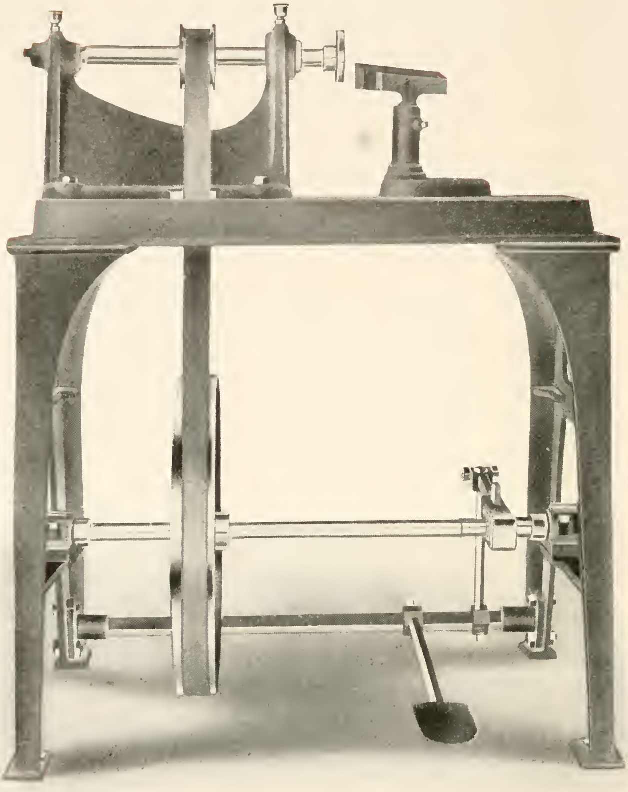


FOR TURNING AND FORMING LARGE PIECES, SUCH AS LARGE HIGH-TENSION INSULATORS AND LARGE PIECES OF WARE, LAVATORY LEGS, Etc.

Height	Weight	Export Weight	Floor Space	Driving Pulley	Speed	Swing	H. P.
4½ ft.	1,100 lbs.	1,300 lbs.	2½ x 6 ft.	4 x 6 in.	500	18 in.	3

Foot-Power Turning Lathe

STYLE "D"

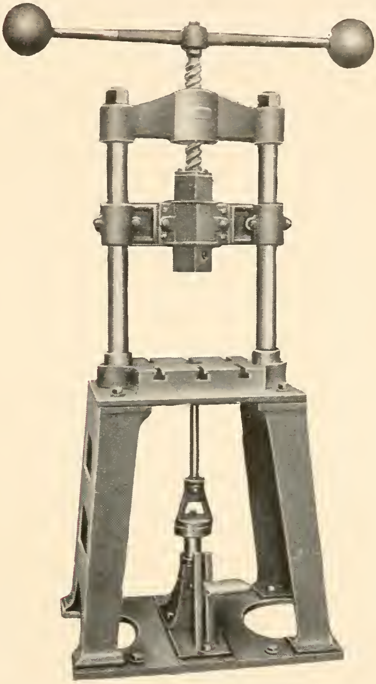


This lathe is built for use where power is not available. It is especially adapted to schools of clay-working or experimental potting. It is well built, and requires very little power to operate.

Height	Weight	Export Weight	Floor Space	Swing
4½ ft.	300 lbs.	450 lbs.	2 x 4½ ft.	18 in.

Our Single Compression Screw Press

This type of press is operated with lever.



This style press is made in the following sizes:

No.	Height	Net Weight	Export Weight	Floor Space	Distance Between Columns
0	4½ ft.	700 lbs.	850 lbs.	2 x 2 ft.	10 in.
1	5 ft.	900 lbs.	1,075 lbs.	2 ft. 6 in. x 3 ft.	12 in.
2	6 ft.	1,250 lbs.	1,450 lbs.	2 ft. 6 in. x 2 ft. 9 in.	15 in.

Nos. 3 and 4 Single Compression Screw Press

The cut on the opposite page shows our new design of a No. 3 single compression screw press. There are several improvements on this machine that we desire to call to your attention, which we have made over the old style screw press.

One of the improvements is the construction of the treadle and lift up rod holder. This lift up rod holder is made in two parts. The reason we make this in two parts is to allow a lateral adjustment of the upper part of the treadle. This lateral adjustment is so that the operator, by slacking off the screw or nut, can bring the lift up rod holder in line with the lift up rod, in case the rod should be set out of center of the die. The lower part of the treadle has a vertical movement in a sleeve or base substantially bolted to base plate of press, which is planed or faced off so that the center line of treadle will line up perfectly with the center of screw and plunger or the upper part of press.

Another improvement we have is the construction of the plunger guide, which consists of an adjustable box that can be adjusted or brought up to the plunger as it wears, or in other words, by setting up the screws on the back part of plunger guide, the plunger can always be kept at perfect right angles with the bed of press.

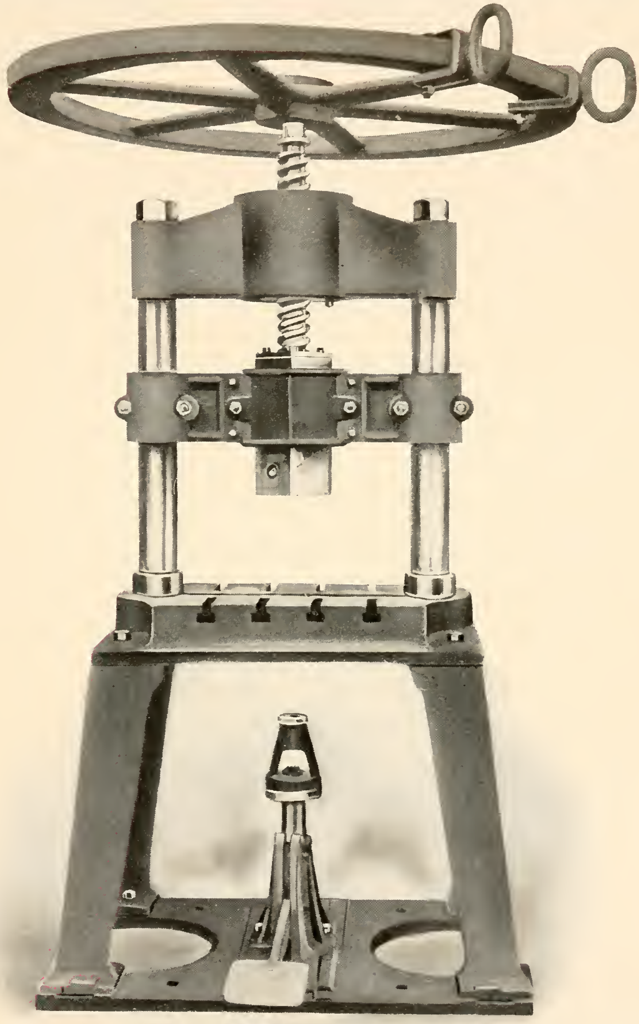
The screw is made of hammered steel working in a phosphorus bronze nut. The pitch of screw is made to suit the work required. What we mean by the pitch of the screw is that one revolution of the hand wheel moves the plunger 3 inches when the screw is cut 3-inch pitch or whatever pitch the screw may be cut, the movement will be according to pitch.

This machine is built of the heaviest construction to withstand the capacity of the press. The capacity of this press is from 12 inches square down when making tile from moistened pulverized clay. When using plastic clay it requires less pressure, therefore the capacity would be larger.

The smaller size presses are made with a ball and lever.

Size	Weight	Export Weight	Height	Distance between Columns	Floor Space
No. 3	2,400 lbs.	2,900 lbs.	6 ft.	20 in.	2⅓ x 3⅓ ft.
No. 4	2,700 lbs.	3,200 lbs.	6 ft.	28 in.	2½ x 3½ ft.

No. 3 Standard Single Compression Screw Press

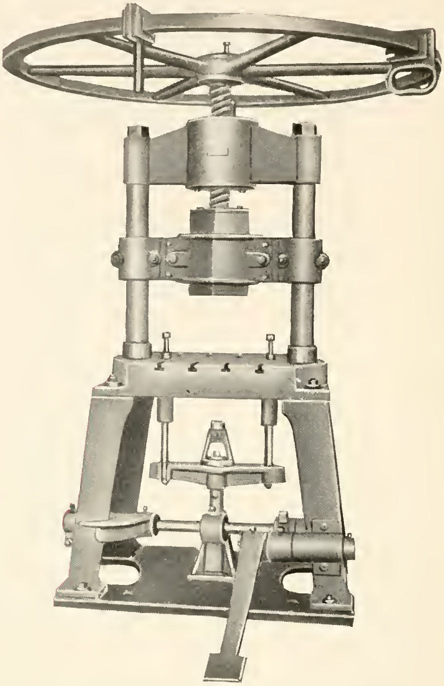


No.	Height	Weight	Export Weight	Distance Bet. Col.	Floor Space	Diameter of Wheel
3	6 ft.	1,600 lbs.	1,900 lbs.	20 in.	2⅓ x 3⅓ ft.	4 or 5 ft.
4	6 ft.	1,900 lbs.	2,200 lbs.	28 in.	2½ x 3½ ft.	5 or 6 ft.

No. 3 Extra Heavy Press

STYLE "A"

DESIGNED FOR WALL OR CERAMIC TILES WITH SLIDING CASE OR MOVING BOTTOM PLUNGER

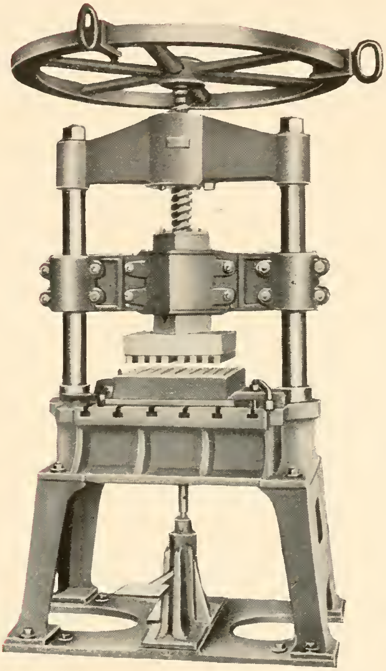


MADE IN ONE SIZE ONLY

This press is operated with two treadles

Size	Height	Net Weight	Export Weight	Distance Between Columns	Floor Space
No. 3	6 ft. 6 in.	2,500 lbs.	2,800	20 in.	2½ x 3½ ft.

No. 4 Ceramic Tile Press



This style press made in one size only, will make one hundred ¾-inch round or square floor tile at one operation, also can be used for making large size tile of any descriptions.

Size	Net Weight	Export Weight	Height	Distance Between Columns	Floor Space
No. 4	1,700 lbs.	2,000 lbs.	6 ft.	28 in.	2½ x 3½ ft.

Improved Ceramic Tile Press

This cut shows our improved tile press, which is used for the pressing of plain or ceramic tiles and is very rapid in operation.

We would call your attention to several of the working parts of this machine, which we claim are far superior to any machine, of a like character, on the market today and which are as follows:

1st The screw which is of hammered steel, is fitted with a deep cut thread and works in a bronze nut, which is fastened in the cross head. This insures easy operation and long life to the machine.

2d You will note the press is fitted with bronze gibbs which are adjustable so you can take up the wear or lost motion and always keep the plunger in perfect alignment with the bed of the press.

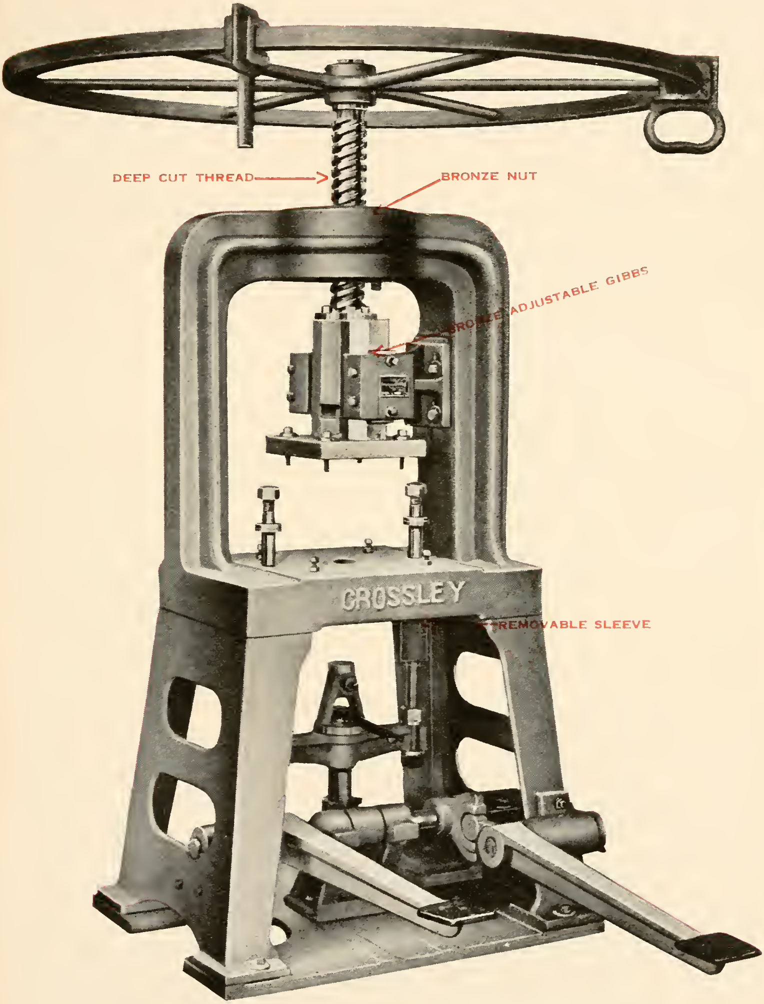
3d The press is equipped with an attachment so that you can either use same with a sliding plunger or sliding case without taking from or adding to.

4th It is machined all over, the bed being machined perfectly true both top and bottom, the legs are also machined on top and bottom also the base plate.

5th You will also notice that underneath the press, where the lifter rods work, there is a removable sleeve, which can be removed easily and bushed when worn without disturbing the rest of the press.

Size	Floor Space	Distance Between Columns	Diameter of Hand Wheel	Domestic Shipping Weight	Export Shipping Weight	Capacity
No. 2	4 ft. 10 in. x 38 in.	19 in.	Operated by Hand Wheel 5 ft.	3,000 lbs.	3,500 lbs.	

Improved No. 2 Ceramic Tile Press



Our Improved No. 6 Screw Press

This machine was designed for the manufacture of large tile blocks, bricks or medium size saggers.

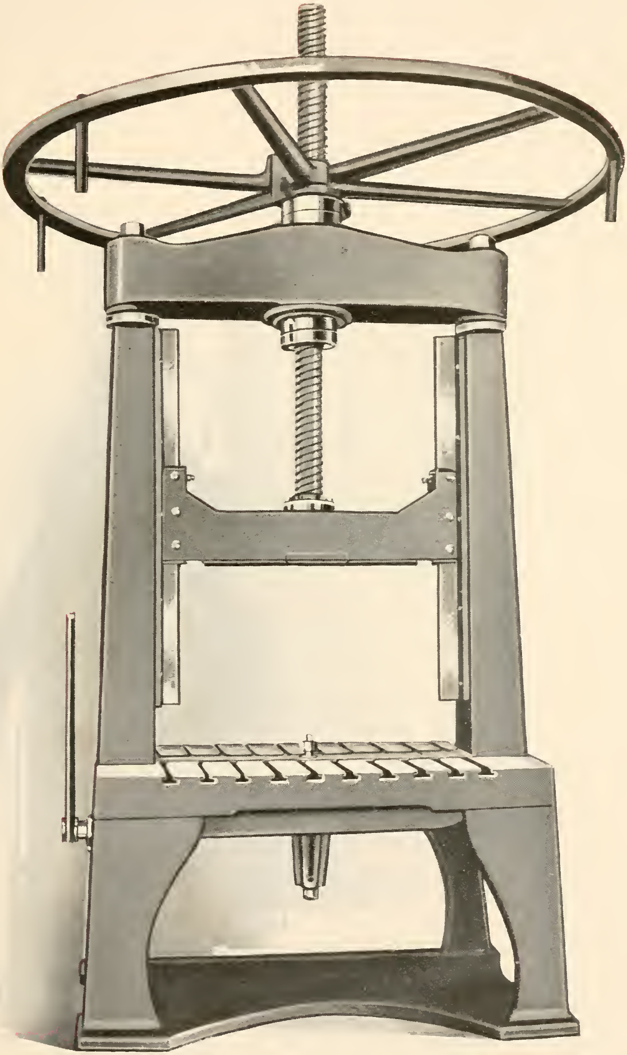
It is fitted with a ball-bearing nut, the screw remaining stationary and the nut revolving with a ball race thrust top and bottom, which reduces the friction to a minimum and makes same easy of operation for a machine of this size.

Dimensions are as follows:

Size	Weight	Export Weight	Total Height
No. 6	7,000 lbs.	7,400 lbs.	11 ft. 8 in.

Distance Between Housings	Height Between Bed and Cross Rail	Floor Space	Diameter of Hand Wheel
35 in.	To suit requirements	5 ft. 1 in. x 3 ft.	7 ft.

Our Improved No. 6 Screw Press



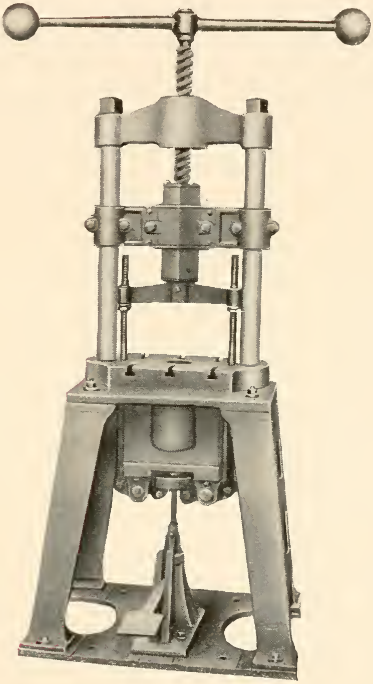
Double Compression Screw Presses

This press is made under the "Crossley patent" and is used for making any article requiring an equal pressure from above and below at the same time, *i. e.*, insulators that are pressed with the groove complete at one operation or any piece that has side holes.

You will notice a cross bar attached to upper plunger through which two side rods pass. These rods are connected to knuckles, which are placed under the bed of press, and when the upper plunger comes in contact with the adjusting nuts on side rods the knuckles press the lower plunger up, thus giving you the double compression. By moving the nuts on side rods you are enabled to exert the pressure on bottom plunger at any given point.

This press can be used either as a double compression or single compression press. By removing side rods you will have a single compression press.

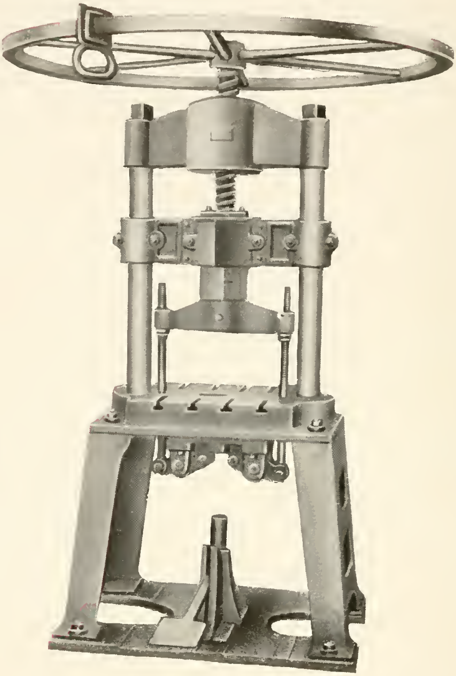
No. 2 Double Compression Screw Press



This style press made in two sizes

Sizes	Height	Weight	Export Weight	Floor Space	Distance Between Columns	Size of Lever
No. 1	5 ft.	1,200 lbs.	1,500 lbs.	2 ft. 6 in. x 2 ft. 6 in.	12 in.	36 in. long
No. 2	6 ft.	1,700 lbs.	2,000 lbs.	2 ft. 6 in. x 2 ft. 9 in.	15 in.	48 in. long

Our No. 3 Double Compression Screw Press for Heavy Duty



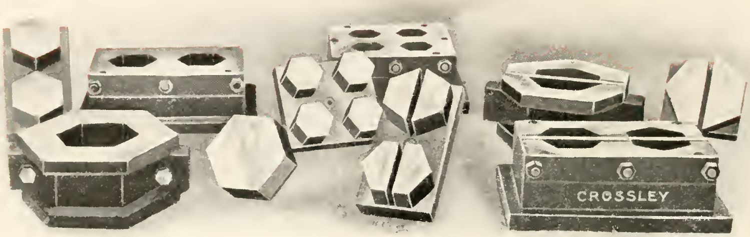
This style press made in the following sizes:

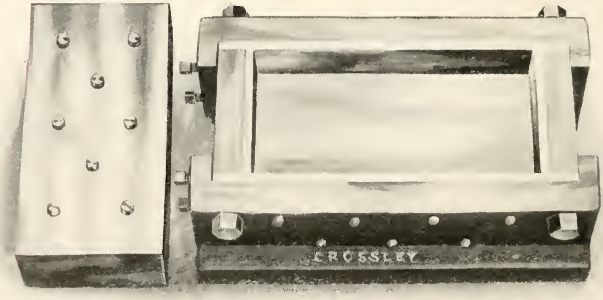
Size	Height	Weight About	Export Weight About	Distance Between Columns	Floor Space	Diameter of Wheel
No. 3	6 ft.	1,600 lbs.	1,900 lbs.	20 in.	2 ft. 4 in. x 3 ft. 4 in.	4 ft. or 5 ft.
No. 4	6 ft.	1,900 lbs.	2,200 lbs.	28 in.	2 ft. 6 in. x 3 ft. 6 in.	5 ft. or 6 ft.

Dies and Molds

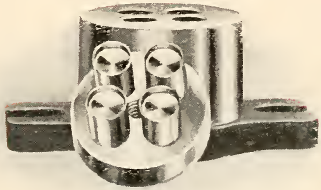
We manufacture dies for all purposes and to make any particular shapes, employing only the most skilled mechanics on this class of work. We are glad at all times to submit drawings and photos and quote prices on any requirement upon request.

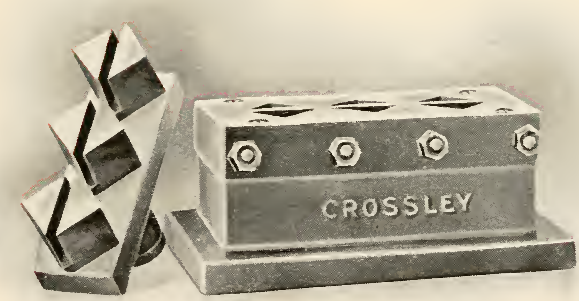
Dies and Molds





Dies and Molds





Our Improved Sagger Press

This cut represents our improved sagger press and is of a very compact construction, requiring very little head room. It can be operated from the floor, without being placed in a pit, the same as a standard screw press. This machine is capable of making from six hundred to eight hundred saggers per ten hours (according to the height), of any of the size saggers given below at a manufacturing cost of less than one cent each. The saggers are made from one piece of clay thus insuring an equal density throughout.

For the operation of this press it requires two men and one boy, one man to operate the hand wheel, one to operate the die and the boy to cut off the clay as it comes from the pug mill and remove the finished saggers to drying room.

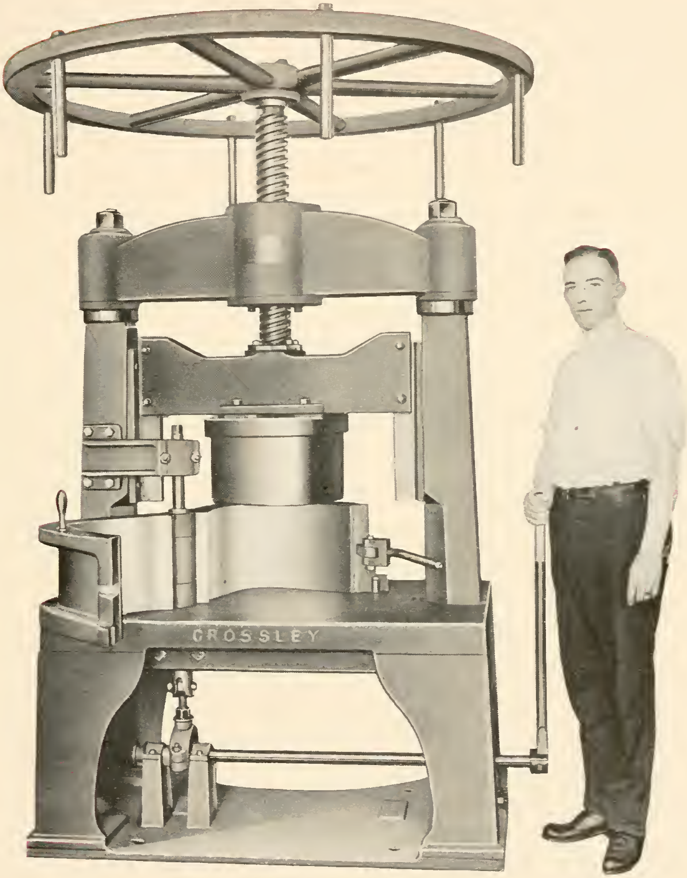
We have equipped a large proportion of the tile and electric porcelain plants with this type press and they are giving perfect satisfaction. A list of users will be given upon application.

This machine is made in one size and is of the following dimensions:

Size	Height	Weight	Export Weight	Floor Space	Capacity
No. 4	7 ft. 3 in.	4,400 lbs.	4,700 lbs.	7 sq. ft.	600 to 800

Oblong	Round		Oval
	Diameter	Height	
12¾ x 8 x 8 in.			15 x 12 x 6½ in.
13¼ x 10 x 8 in.	14 in.	8 in.	15 x 12 x 8 in.
14 x 9 x 8 in.	12 in.	8 in.	
13 x 8 x 8 in.	11 in.	8 in.	
15⅜ x 8 x 8 in.	10 in.		

Our Improved Sagger Press



Improved Power Sagger Press

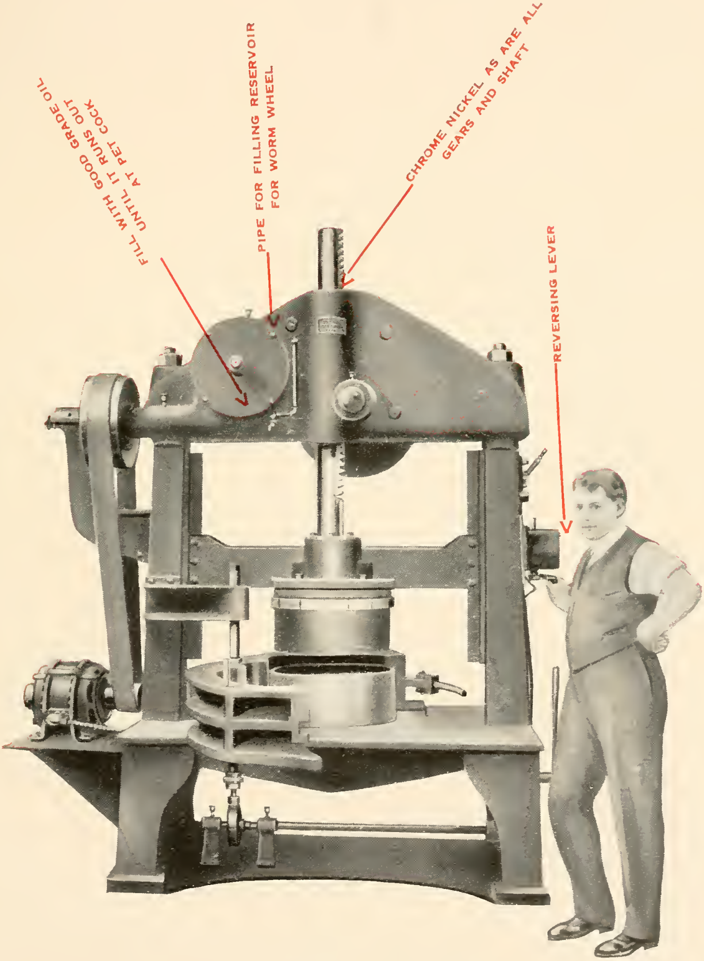
These cuts represent our electric-driven power sagger press which can also be arranged to be driven direct from main line shaft where electric current is not available.

These presses are made in three sizes, viz.: Nos. 1, 2 and 3, and are used for the making or forming of any article where great pressure is required, such as saggers that are used in electric porcelain, tile, general ware and sanitary potteries, emery wheel works, etc.

The construction of these presses is of the usual **Crossley Standard** throughout, being very rigid and self-contained in every respect. All working parts in the head are made of chrome nickel steel and the gearing is machine cut. The crosshead is fitted with adjustable bronze gibbs, which enables the operator to keep the plunger in perfect alignment with the bed of the press at all times. This type of construction means long life to the machine and also reduces the cost of up-keep to a minimum. With these presses we are enabled to exert a greater pressure with less horse-power than any other machine on the market and can be set up in any desired part of factory requiring but very little head room.

Improved Power Sagger Press

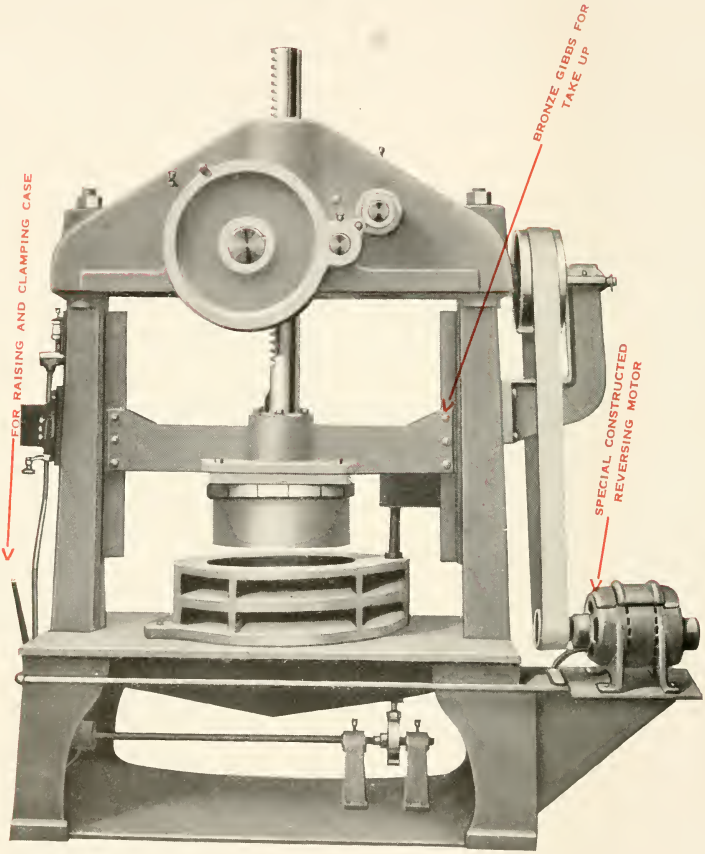
(CONTINUED)


FILL WITH GOOD GRADE OIL UNTIL IT RUNS OUT AT PET COCK
PIPE FOR FILLING RESERVOIR FOR WORM WHEEL
CHROME NICKEL AS ARE ALL GEARS AND SHAFT
REVERSING LEVER

No. 3 PRESS (FRONT VIEW)
Showing Sagger, 21$\frac{3}{16}$ x 14$\frac{3}{16}$ x 7$\frac{3}{4}$ inches High

Improved Power Sagger Press

(CONTINUED)


BRONZE GIBBS FOR TAKE UP
FOR RAISING AND CLAMPING CASE
SPECIAL CONSTRUCTED REVERSING MOTOR

No. 3 PRESS (BACK VIEW)

Improved Power Sagger Press

(CONTINUED)

The saggers are made from one piece of clay cut off at the pug mill the proper length to give you the exact weight, it is then placed in die and pressed to shape.

We will positively guarantee these machines to produce a far superior sagger in every way that will stand more fires than the ordinary hand-made saggers at a saving of from 50 to 75 per cent.

The No. 1 press will make the following size saggers or other pieces of a like size. (Saggers given below are those common to the electric porcelain and tile trade.)

Oblong	Round		Oval
	Diameter	Height	
12¾ x 8 x 8 in.			15 x 12 x 6½ in.
13¼ x 10 x 8 in.	14 in.	8 in.	15 x 12 x 8 in.
14 x 9 x 8 in.	12 in.	8 in.	
13 x 8 x 8 in.	11 in.	8 in.	
15⅜ x 8 x 8 in.	10 in.		

The No. 2 press is used for the making of intermediate size saggers, *i. e.*, those that are too large for the No. 1 press and not large enough for the No. 3.

The No. 3 press will make the following size saggers or other pieces of a like size:

Sanitary Saggers

Oval 24⅝ x 17¾ x 10¾ in. high.
Oval 22¾ x 16 9/16 x 9 in. high.
Oval 28⅝ x 18⅜ x 11 in. high.
Oval 27¾ x 17 x 9½ in. high.

Improved Power Sagger Press

(CONTINUED)

Sanitary Saggers—Continued

Oblong 29½ x 11¾ x 11¾ in. high.
Oblong 24¾ x 19¾ x 9¼ in. high.
Oblong 28⅛ x 11⅝ x 10½ in. high.
Oblong 23¾ x 19⅜ x 8¼ in. high.
Oval 28½ x 19½ x 11¼ in. high.
Lavatory special, 30 x 21¾ x 9 in. high.

General Ware Saggers

Oval 16 7/16 x 10 7/16 x 9 in.
Double banjos, 17 11/16 x 9⅜ in..
Double banjos, 16 3/16 x 9½ in.
Double banjos, 19⅜ x 9⅜ in.
Double banjos, 17 5/16 x 9½ in.
Single banjos, 18⅜ x 12 in.
Single banjos, 21⅛ x 10 11/16 in.
Single banjos, 16⅝ x 8¼ in
Single banjos, 18⅞ x 9⅜ in.
Single banjos, 15½ x 10¾ in.

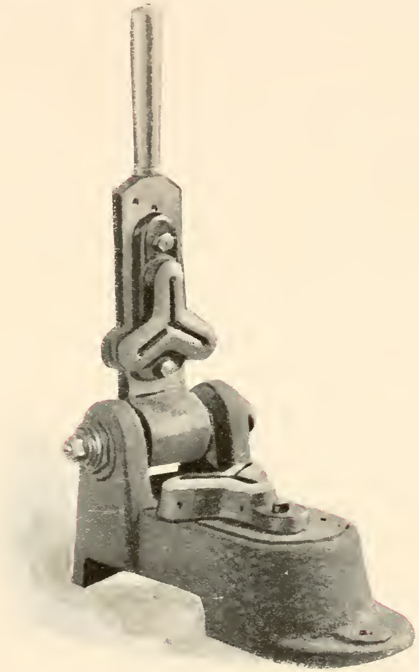
(All sagger dimensions given are inside measurements.)

DIMENSIONS OF PRESSES

Size	Floor Space	Height	Weight	Export Weight	H. P.	Capacity
No. 1	6 x 3 ft.	7 ft. 6 in.	5,400 lbs.	5,700 lbs.	3	
No. 2	7 x 3 ft.	10 ft. 9 in.	8,000 lbs.	8,450 lbs.	5	
No. 3	8 x 3 ft.	10 ft. 9 in.	9,700 lbs.	10,700 lbs.	7½	

In ordering presses give largest size sagger you wish to make.

Hand Stilt Press



This press is used for making stilts and pins, which are used for placing ware in kilns. The joints or knuckle is fitted with conical or taper steel pin, which makes it impossible to get out of line. It is a very well-built and accurate machine, easy to operate, being simple and having few working parts; it costs nothing to keep in repair. We can furnish any style die desired. This machine is made in two sizes only, of the following dimensions:

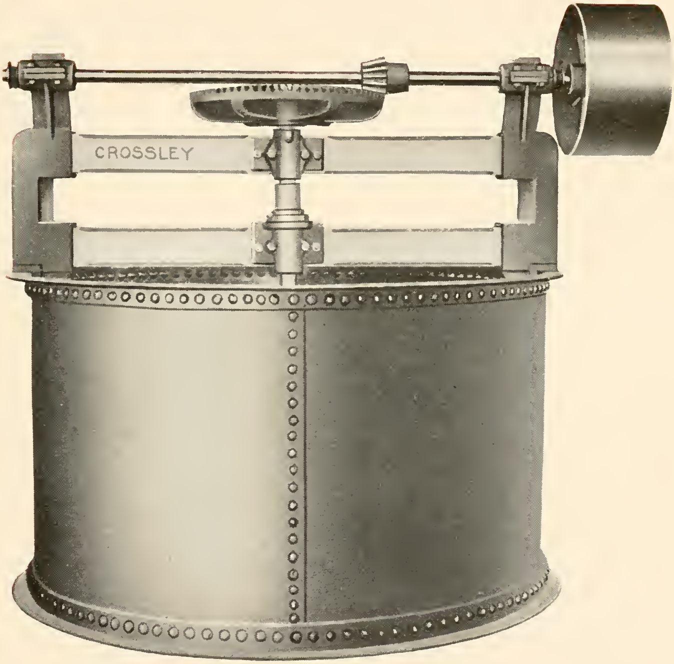
Weight, 75 pounds.
Height, 8 inches.
Floor space, 6 x 14 inches.

Agitator or Mixing Tank

This machine was designed for the mixing of different liquid materials, such as clay, slip, paint, glazes, composition, etc., and can be built to suit any desired capacity with either steel or wooden tank as conditions may require.

The side brackets are of heavy cast-iron construction and the vertical shaft is fitted with a special thrust bearing to the cross-rails which eliminate the use of a step bearing. The machine in general is built of the very best material and workmanship throughout, and can be fitted with friction clutch, or tight or loose pulley. Can be built any size to suit purchaser.

Agitator or Mixing Tank



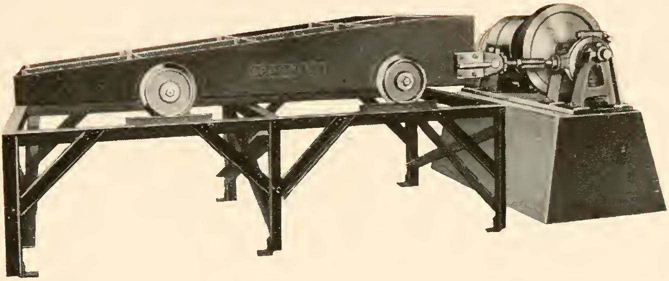
Grog Shaker

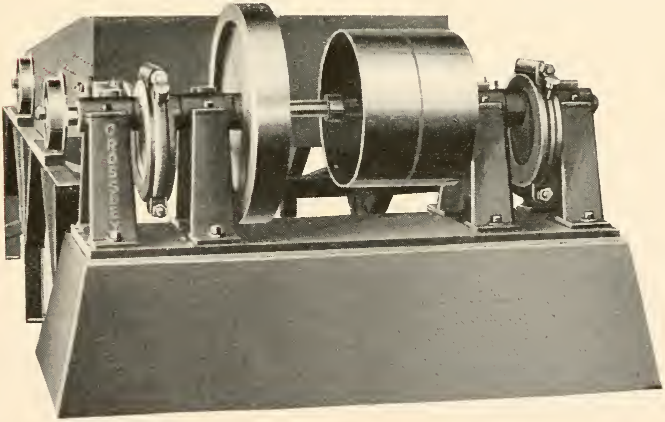
This machine was designed especially for manufacturers of fire clay products to do away with the hand screening of grog, and is so constructed that you can get any size grog you desire, by placing different size screens in the compartments provided. The compartments are provided with removable frames to which the screens are fastened. It operates in an eccentric motion and is a very valuable machine to any one desirous of screening grog or any other dry material.

This machine is of heavy construction, and is built in one size only in the following dimensions:

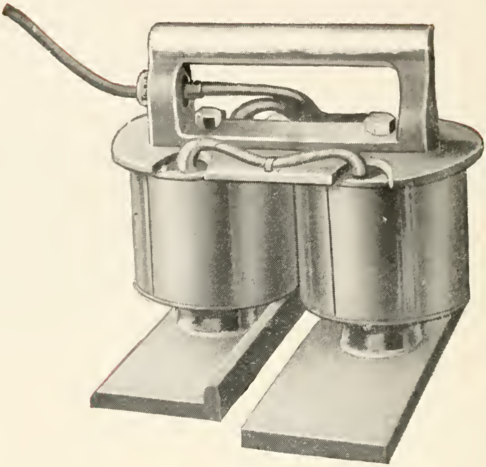
Height	Floor Space	Weight	Export Weight	Speed R. P. M.	Size of Pulley	H. P.
4 ft. 4 in.	14 ft. long 5¾ ft. wide	1100	1600	80	18 x 6½ in.	3

Grog Shaker





Electric Magnets



This magnet was designed to take iron out of slip in one of the most up-to-date potteries in the City of Trenton, with such good results that we are now offering them to the trade.

They have passed through the experimental stage and have proven beyond a doubt to be the best magnet for this work.

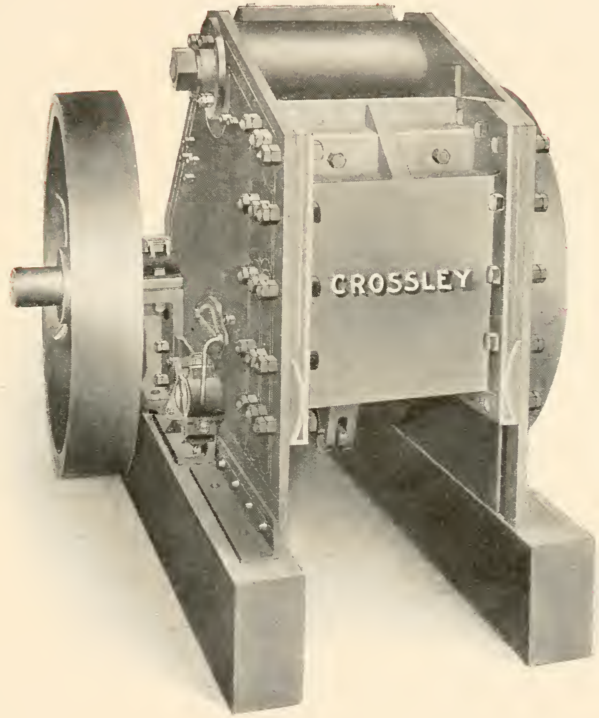
A number of magnets have been installed in potteries and porcelain works in this and other cities.

This magnet is made to operate on direct current, 10 to 250 volts.

However, they may be operated on alternating current by using a rectifier, storage batteries, or small motor generate set. Consumes about 50 watts; or equivalent to 16 c. p. carbon lamp.

In ordering it is necessary to state the current available and voltage.

Clay and Shale Crusher



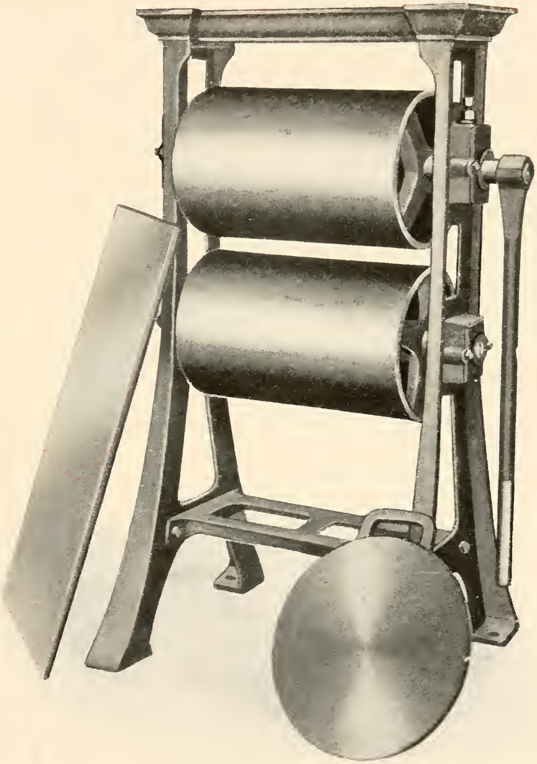
LET US ESTIMATE ON YOUR REQUIREMENTS IN THIS LINE

Decorators' Printing Press

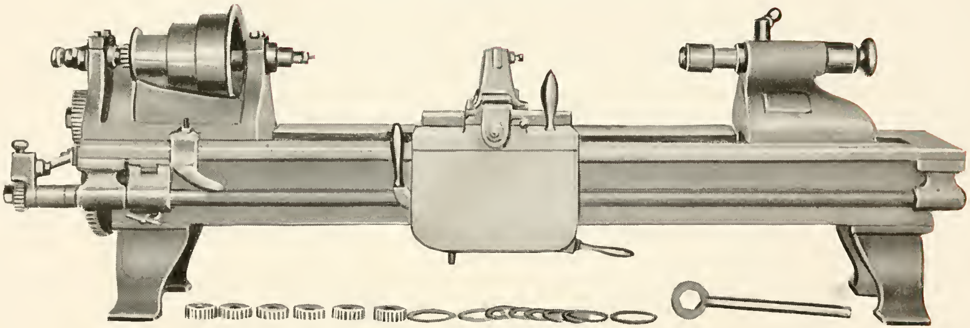
Our decorators' printing press is, no doubt, the best machine on the market. It is built with the very best materials and workmanship. The rollers are turned perfectly true, having our special bronze bearings, which insure durability, as well as smooth and easy running. This machine is furnished with standard size platen or table, and is built mechanically correct in every way. It is used for transferring designs from copper or steel plates to paper for decorating purposes in potteries, lamp works, etc. Write us for prices and further particulars.

Height	Weight	Export Weight	Floor Space	Size of Rolls
4 ft.	425 lbs.		2 x 2½ ft.	12 x 18 in.

Decorators' Printing Press



Jar Ring Lathe

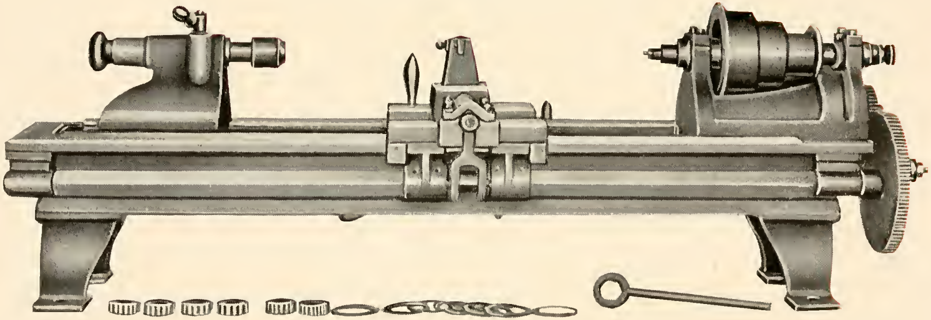


FRONT VIEW

This machine is built of the very best material and workmanship. The bearings are made of the very best bronze, the spindle is made of crucible steel as are the small gears, which are hardened. The tail stock is supplied with a hardened ball bearing. We use cut gears throughout and the machine is automatic in its operation.

Our Automatic Jar Ring Lathe

FOR CUTTING RUBBER JAR RINGS

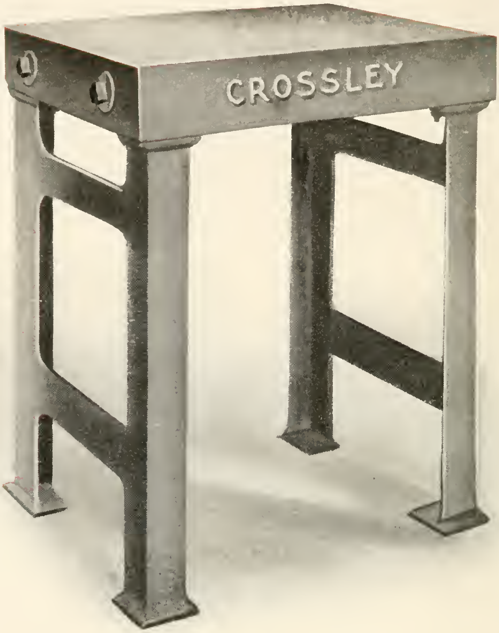


BACK VIEW

ONE OPERATOR CAN OPERATE TWO MACHINES

Height	Weight	Export Weight	Speed of Countershaft	Bench Space	Will Cut From	Capacity Per Min.
20 in.	325 lbs.	375 lbs.	600 Rev. P. M.	1½ x 5 ft.	8 to 22 per in.	110 Rings

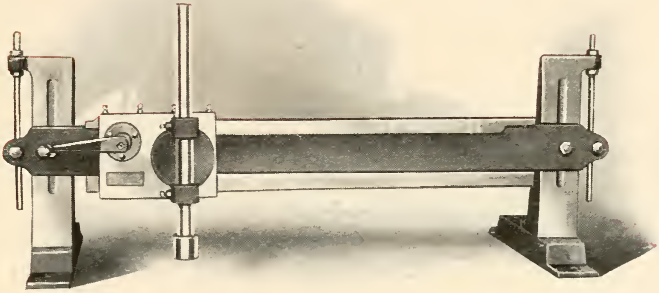
Steam Stoves



We make steam stoves and tables to suit any special needs of the decorator. Our standard steam stove, as shown on this page, is very well built, weighing about 250 pounds. The table is tested under pressure before it leaves our works. We build these stoves in several different sizes, which are constantly kept in stock. The standard table is 18 inches by 24 inches, and stands 30 inches high.

Weight, about 250 pounds.
Weight of double stove, about 450 pounds.

Our Improved Emery Wheel Shaving Machine



This cut illustrates our emery wheel shaver, which is used for shaving wheels to desired thickness. It is built of the very best material and workmanship throughout having machine-cut gears and racks and fills a long-felt want for emery wheel manufacturers.

Price on application.

It is built in one size only as follows:

Distance Between Housings	Weight	Export Weight
3 ft. 8½ in.	600 lbs.	750 lbs.

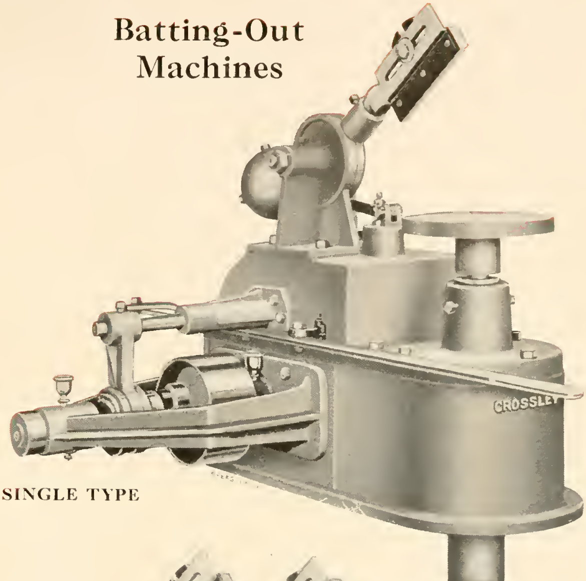
Batting-Out Machines

These cuts show our Single and Double Batting-Out Machines, which eliminate the batter-out. The Jiggerman takes a ball of clay and throws it on the face plate of machine, pushes in the starting lever, he is then free to proceed with his jiggering. When the bat is spread the machine automatically stops.

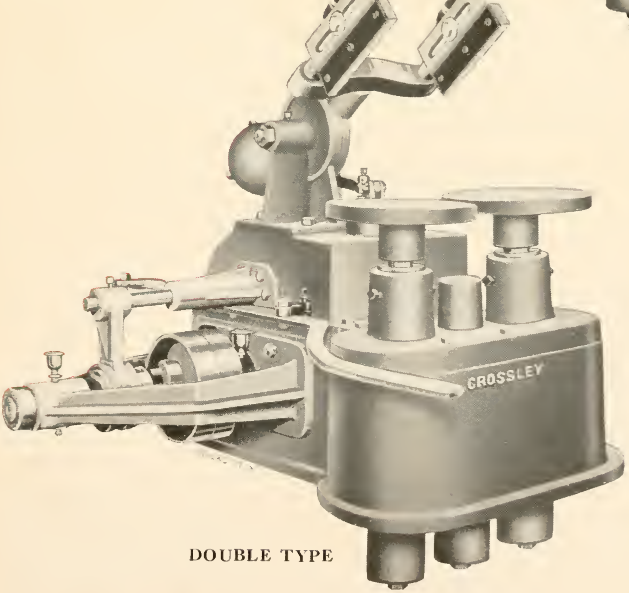
Weights, etc., are as follows:

	Height	Weight	Export Weight	Bench Space	Size of Pulley	Speed	H. P.
Single Machine	27 in.	650	700	3 ft. x 2½ ft.	7 in. x 3 in.	266	1
Double Machine	27 in.	850	925	3 ft. x 2¾ ft.	7 in. x 4 in.	266	1

Batting-Out Machines

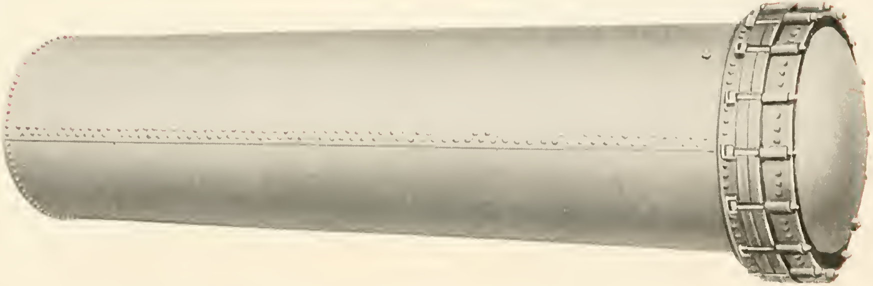


SINGLE TYPE



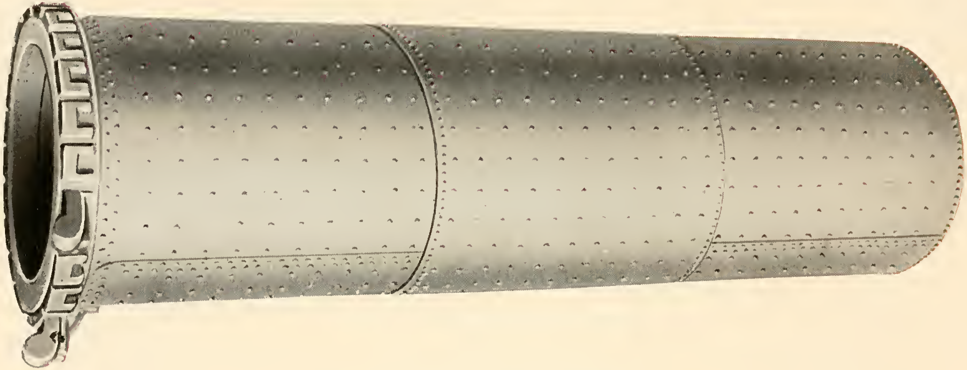
DOUBLE TYPE

This is our Standard Vulcanizer



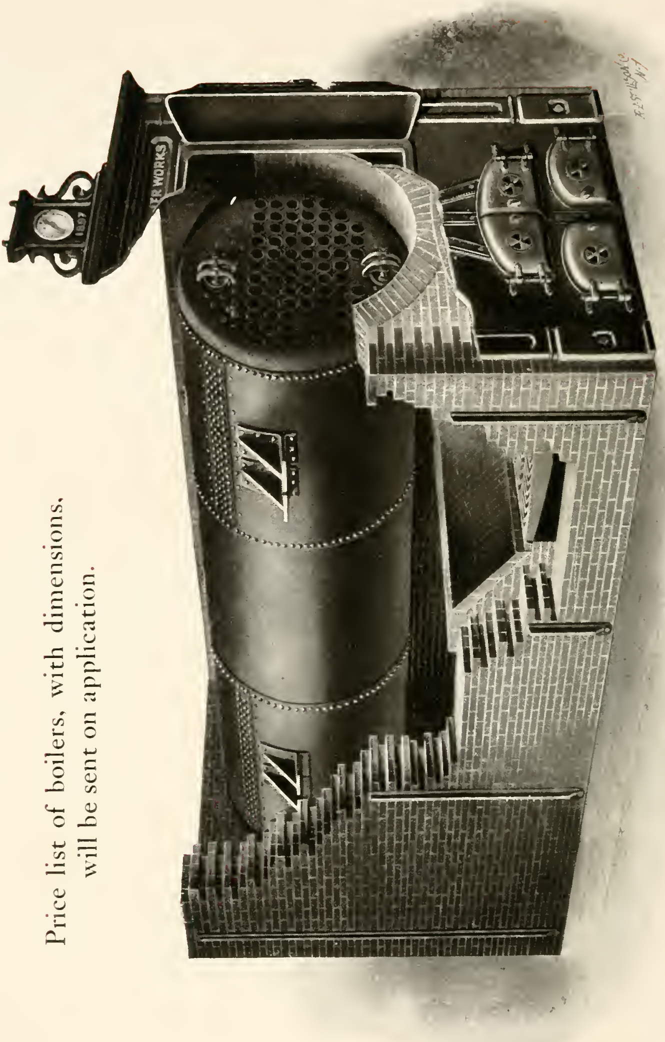
WE MAKE THIS STYLE IN ANY SIZE TO SUIT THE TRADE
KINDLY LET US FIGURE ON YOUR NEXT REQUIREMENTS

This is our Double-Jacketed Vulcanizer



LET US HAVE YOUR INQUIRIES

Steam Boilers

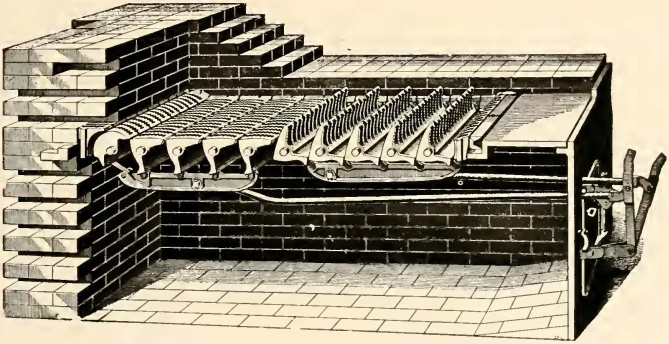


Price list of boilers, with dimensions,
will be sent on application.

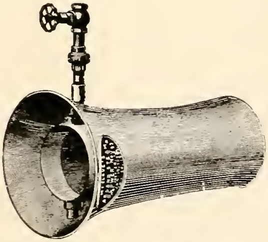
We are prepared to furnish any standard size of boiler promptly.

Improved Shaking Grate and Steam Blower

WHICH INSURES PERFECT COMBUSTION AND LARGE SAVING IN FUEL

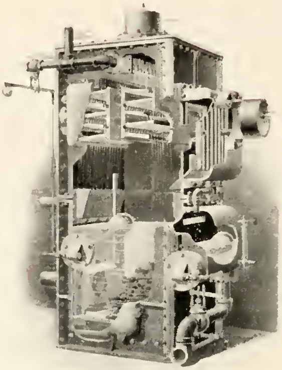


This means reduction in cost of operation. No waste fuel through combustion, removal of fine ashes, cleaning uniformly, gets rid of clinkers without opening fire doors.



ARGAND STEAM BLOWER

The Cochrane Feed Water Heater



Interior view of the Cochrane heater and purifier, for use in connection with engines or pumps exhausting freely to the atmosphere, or against back pressure up to ten pounds.

The Cochrane open heater utilizes the exhaust steam to heat all the boiler feed water up to boiling point. This saves 16 per cent. of the coal bill, and protects the boilers against injury from cold feed.

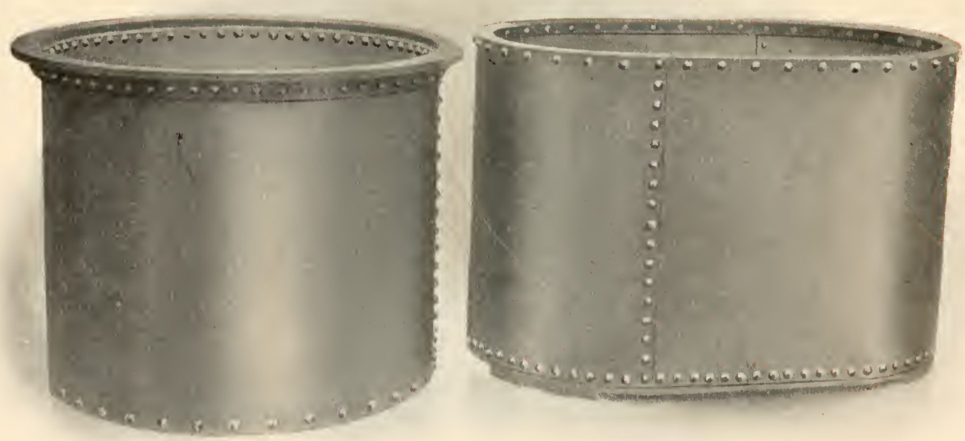
The virtual steaming capacity of the boiler is increased in the same proportion, that is, six boilers and a Cochrane heater will make as much steam as seven boilers fed with cold water. In other words, the installation of a Cochrane heater gives you more steaming capacity if required, or makes possible the laying off of one of the present boilers for cleaning while keeping up the steam output.

The steam consumed in heating the feed water in a Cochrane heater is condensed and added to it, thereby reducing the water bill by about one-sixth. The heater also serves as a hot well or receptacle for live steam drips or other water about the plant suitable for boiler feeding.

Cochrane open-feed water heaters are substantially built of heavily ribbed cast-iron; fittings of brass, bronze or copper. Convenient doors are provided for removing the filtering material and for cleaning the heater. There are no troublesome internal compartments.

The water is heated by immediate, actual contact with the steam and neither the capacity nor the temperature to which the water is heated are affected by scale-forming matter in the water, that is, the full temperature of 210 degrees F. is obtained as long as there is sufficient steam.

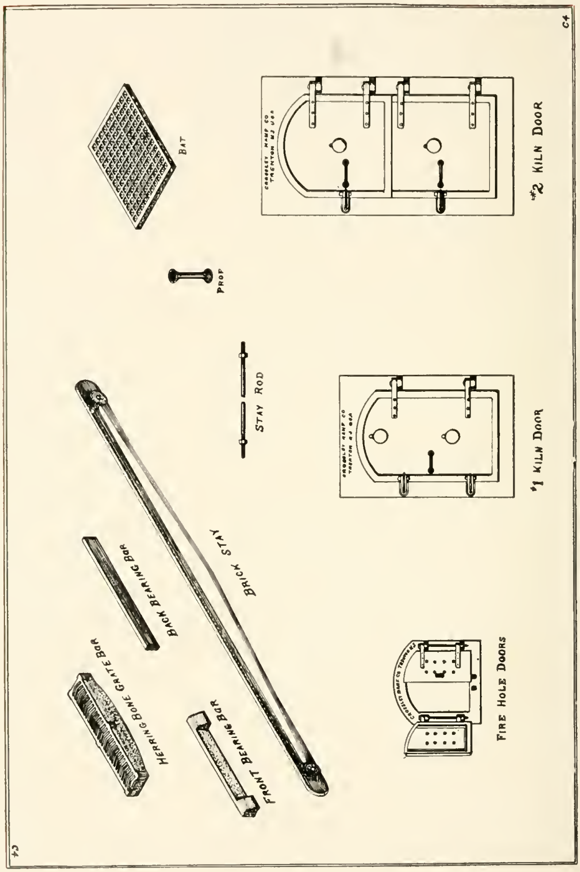
As no part of the heater is subject to boiler pressure, leakage does not occur. These heaters are widely used for heating water for industrial purposes in paper mills, pulp mills, textile mills, as well as for boiler feeding. Write for our treatise on the "Profitable Utilization of Exhaust Steam."



Steel and Iron Tanks

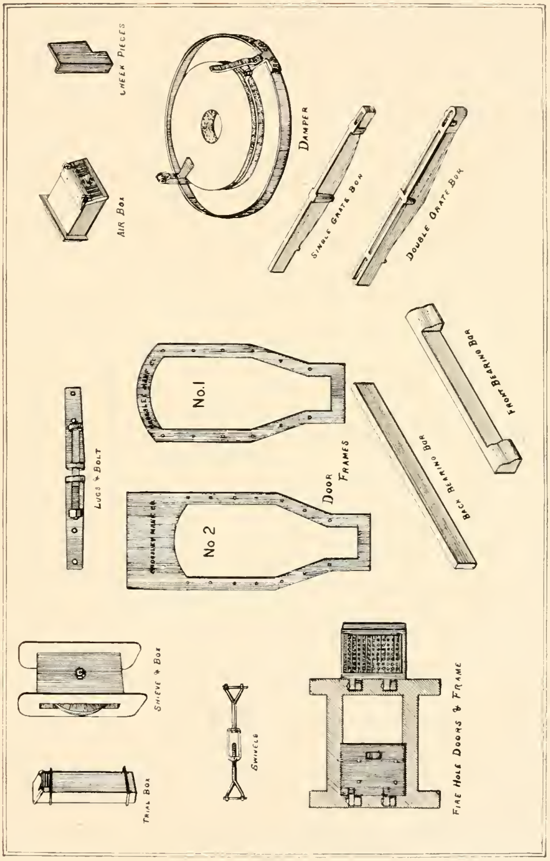
We are prepared to build all sizes and shapes of steel or iron tanks and cylinders at moderate prices. Our sheet metal department is well equipped with all modern apparatus, such as compressed air and hydraulic riveters and tools, and pneumatic machinery, etc., which are essential to a modern, well-equipped plant. We employ only the best skilled labor and use the highest grade materials obtainable, which fact, together with our long experience in this line, is sufficient assurance of good work. Let us figure on your requirements.

Iron Work for Decorating Kilns



DECORATING KILN IRON WORK

Iron Work for Biscuit or Glost Kilns



BISCUIT OR GLOST KILN IRON WORK

ESTIMATES CHEERFULLY GIVEN ON ALL KINDS OF WORK

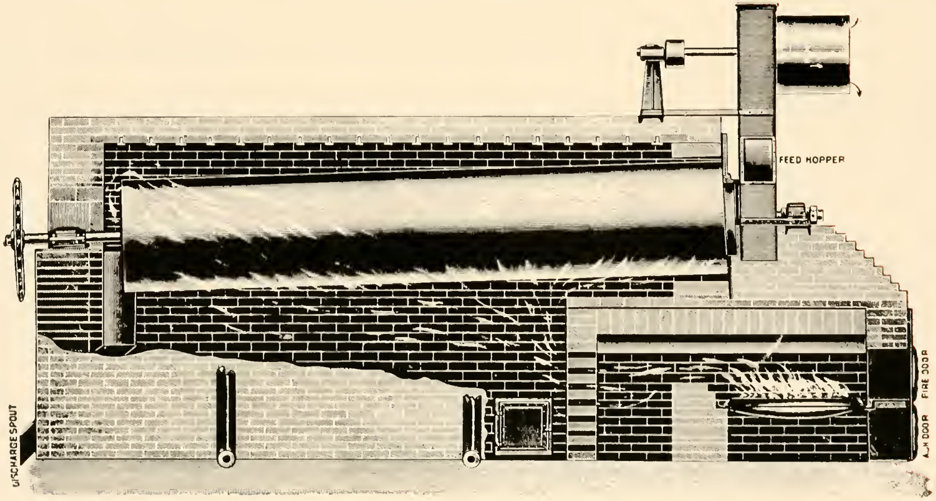
Rotary Dryers

The illustration on opposite page shows our rotary dryer. The regular size is 36 inches in diameter, 16 feet long, but we make other sizes. The cylinder is of sheet steel ¼ inch in thickness, bent to a true circle, and made of sheets the full length of the cylinder. All seams are the longitudinal way of the cylinder, and all rivets are staggered and driven hot, and of sufficient size to make a good and substantial job. No cross seams in the cylinder at all. All the material furnished for the dryer is of the best of its kind for the purpose. All parts of the dryer are made to expand or contract without damage.

The cylinder is supported by two heavy steel shafts or gudgeons, running in special heavy journal boxes, one shaft at each end, and each shaft is securely fastened to two special steel spiders, which are riveted to the shell of the dryer. Inside of the cylinder are placed a number of angles running the entire length of the cylinder, which are so arranged as to form on inter-elevator and cascade the material. The illustration shows the dryer set in brick work, so arranged that the product of combustion or the heat, passes first around the outside of the cylinder and then through it, passing through the material to be dried and out through the breeching and fan at the front end. The dryer being set at a slight incline, every revolution of the cylinder carries the material forward toward the end of the dryer, where the material is discharged. The dried material drops into a spout which delivers it outside of the brick work, where it can be elevated or conveyed to any desired point. This dryer is usually driven by a large sprocket-wheel, but an electric motor or other means will be furnished when desired. The dryer is especially adapted for drying such substances as clay, iron ore, marls, sand, pebbles, chalk, phosphate rock, infusorial earth, Fuller's earth, nitrate of soda, sawdust, and all similar materials, in quantities from 6,000 to 30,000 pounds per hour, according to the amount of moisture contained therein. We have them drying 20,000 pounds of sand an hour, sand containing from 8 to 10 per cent. of moisture. It will evaporate from 8 to 10 pounds of moisture with one pound of bituminous coal, or its equivalent.

No.	Diameter of Cylinder	Length of Cylinder	Total Length of Brick Work	Total Width of Brick Work	Total Height of Brick Work	Total Weight of All Iron Work	Common Brick	Fire Brick	H. P.
1	30 in.	12 ft.	17 ft.	5½ ft.	8 ft.	6,000 lbs.	6,000 lbs.	2,500 lbs.	4
2	36 in.	16 ft.	21 ft.	6½ ft.	8 ft.	9,000 lbs.	10,000 lbs.	3,600 lbs.	5
3	36 in.	18 ft.	23 ft.	6½ ft.	8 ft.	10,000 lbs.	10,500 lbs.	3,600 lbs.	5
4	36 in.	20 ft.	25 ft.	6½ ft.	8 ft.	11,000 lbs.	11,000 lbs.	3,600 lbs.	6

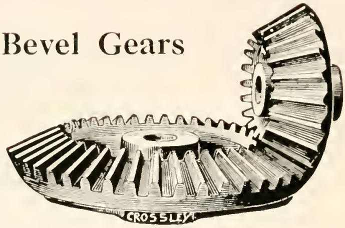
Rotary Dryer



SHOWING DRYER SET IN BRICK WORK

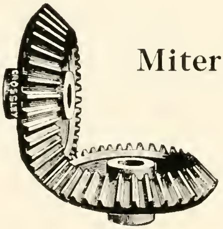
We have a full line of gears always in stock.

Bevel Gears



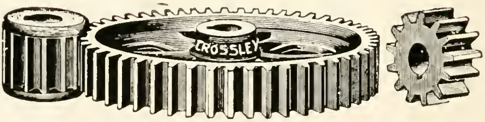
When ordering gears state pitch, width of face, pitch diameter, size of shaft and number of teeth.

Miter Gears



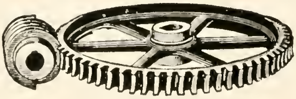
Special gears of any design or shape can be furnished promptly.

Spur Gears

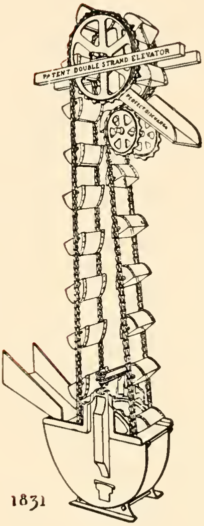


We will send full gear lists and prices upon application.

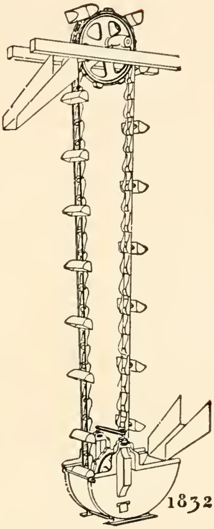
Worms and Worm Gears



Conveying Machinery



1831

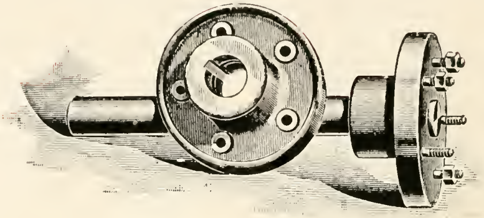


1832

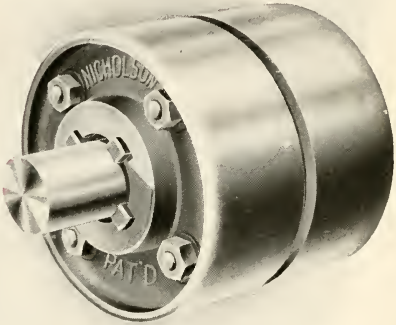
Perfect discharge elevators permit use of spaced buckets, and, by completely inverting them, make clean delivery into chute at elevator head. They are run at relatively low speeds, and have met with much favor for handling breakable substances or materials which tend to cling to the buckets, such as clay, grogg, pulverized materials, etc.

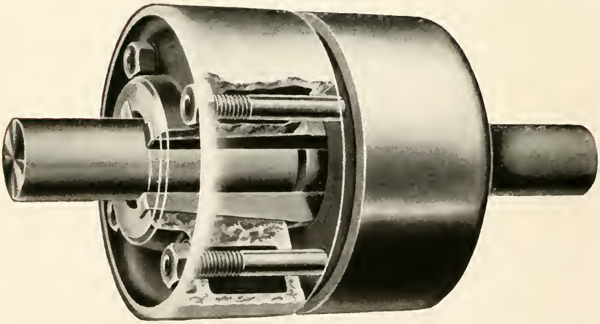
We can send full information, with prices, on these conveyors and elevators, to suit all requirements of the clay worker.

Standard Plate Couplings



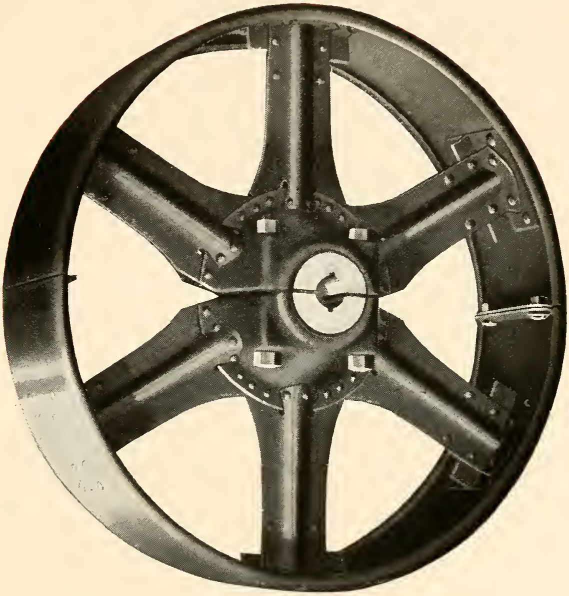
Nicholson Compression Couplings





PRICES ON APPLICATION

Oneida Pressed Steel Pulleys



Safety Set Collars

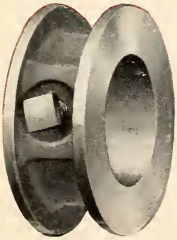


Fig. T-15
SOLID

PRICES ON APPLICATION

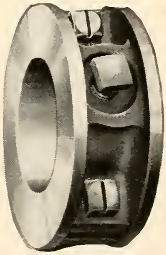
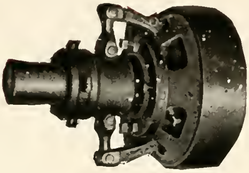


Fig. T-16
SPLIT

Friction Clutches



Price List

Including Shifter Forks and Fulcrum
Subject to Discount

Diameter of Clutch	H. P. at 100 R. P. M.	Largest Bore	Clutch with Extension Sleeve	Cut off Coupling
7 in.	3	2 in.	$25.00	$25.00
8 in.	6	2 in.	30.00	30.00
10 in.	10	2½ in.	40.00	39.00
12 in.	15	3½ in.	50.00	48.00
15 in.	25	4½ in.	65.00	62.00
17 in.	32	5 in.	90.00	85.00
20 in.	40	5½ in.	120.00	114.00
24 in.	60	6½ in.	165.00	155.00

NOTE—17, 20, 24 in. Clutches made with three levers in place of two, as shown in cut.

We furnish any kind of pulley wanted.

Universal Giant Head Shaft Hangers

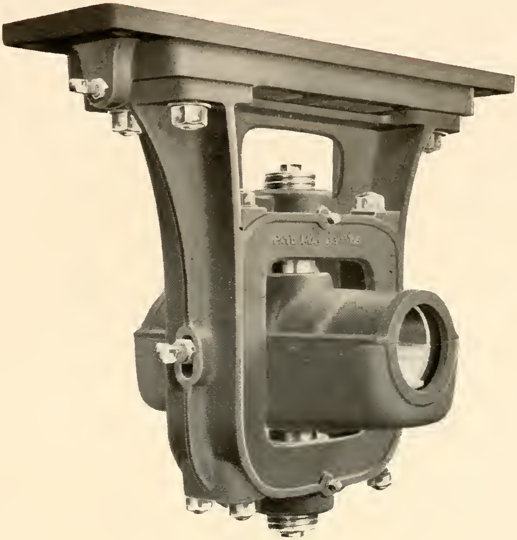


Fig. T-25
EXTRA HEAVY
ADJUSTABLE, RING OILING, BALL AND SOCKET

Universal Giant Bearings

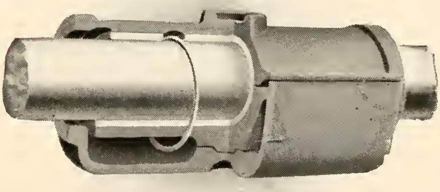


Fig. T-21
RING OILING

The bearings used in the universal giant head shaft hangers, drop hangers, bracket hangers, post hangers and pillow blocks, are babbitted, reamed, and ends are faced. (Head shaft bearings fit the next size larger than regular frames.)

Universal Giant Bracket Hanger

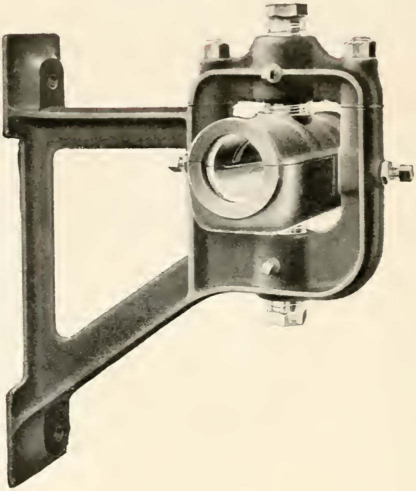


Fig. T-28

ADJUSTABLE, RING OILING, BALL AND SOCKET

LIST PRICES

Shaft Sizes Inches	Reach in Inches						
	10	12	14	16	18	20	24
$1\frac{7}{16}$	$7.20	$7.60	$8.00	$8.40	$8.90		
$1\frac{11}{16}$	7.70	8.10	8.50	8.90	9.40		
$1\frac{15}{16}$	9.50	10.00	10.50	11.00	11.75	$12.50	$13.60
$2\frac{3}{16}$	10.25	10.75	11.25	11.75	12.50	13.25	14.35
$2\frac{7}{16}$	14.40	15.00	15.60	16.30	17.00	17.90	21.00
$2\frac{11}{16}$	15.40	16.00	16.60	17.30	18.00	18.90	22.00
$2\frac{15}{16}$	19.50	20.25	21.00	22.00	23.00	24.00	26.00
$3\frac{3}{16}$	20.75	21.50	22.25	23.25	24.25	25.25	27.25
$3\frac{7}{16}$	24.10	28.00	29.00	30.50	32.00	34.00	38.00
$3\frac{11}{16}$	25.60	29.50	30.50	32.00	33.50	35.50	39.50
$3\frac{15}{16}$		32.75	37.00	39.00	41.00	43.00	46.00

Universal Giant Head Shaft Hanger

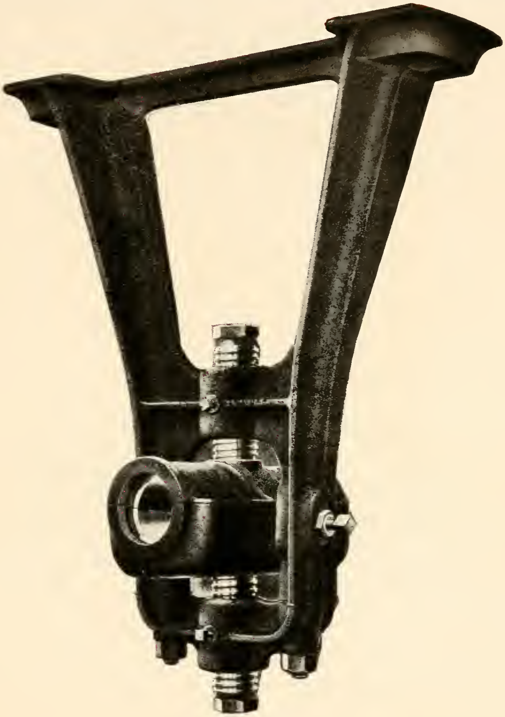


Fig. T-27

ADJUSTABLE, RING OILING, BALL AND SOCKET

LIST PRICES

Shaft Sizes Inches	Range of Drops in Inches							
	7-9	10-12	13-15	16-18	19-20	23-25	28-30	34-36
$1\frac{3}{16}$	$4.20	$4.50	$4.80	$5.30	$5.70			
$1\frac{7}{16}$	5.50	6.10	6.70	7.20	7.80	$9.00		
$1\frac{11}{16}$	6.00	6.60	7.20	7.70	8.30	9.50		
$1\frac{15}{16}$	7.25	8.25	9.00	9.50	10.40	11.40	$14.65	
$2\frac{3}{16}$	8.00	9.00	9.75	10.25	11.15	12.15	15.40	
$2\frac{7}{16}$	11.40	12.40	13.10	13.85	14.80	17.50	19.10	$22.80
$2\frac{11}{16}$	12.40	13.40	14.10	14.85	15.80	18.50	20.10	23.80
$2\frac{15}{16}$	15.00	16.70	17.65	19.00	20.00	21.60	24.65	29.15
$3\frac{3}{16}$	16.25	17.95	18.90	20.25	21.25	22.85	25.90	30.40

Ring Oiling Rigid Pillow Blocks

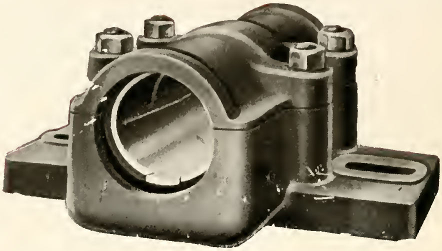


Fig. T-40
STYLE FOR $3\frac{3}{16}$ INCHES AND SMALLER SHAFTS

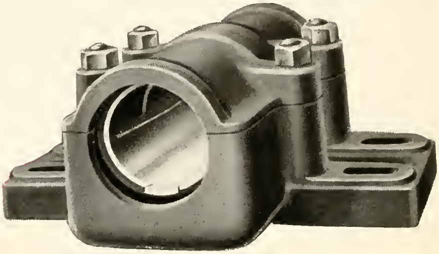


Fig. T-41
STYLE FOR $3\frac{7}{16}$ INCHES AND LARGER SHAFTS

Ring oiling rigid pillow blocks have slotted holes in base for lateral adjustment.

Bearings are ring oiling, babbitted, reamed to size and ends faced.

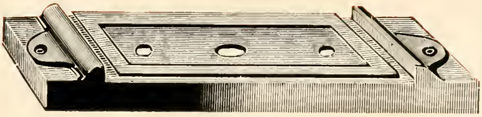
The rings used are of spring steel, tempered.

The oil reservoir is of large proportions. The lower half of bearing has ball and socket contact with base of outer shell.

Dust proof bearings can be furnished.

Shaft Sizes Inches	List Prices	Shaft Sizes Inches	List Prices
$1\frac{3}{16}$	\$4.00	$2\frac{15}{16}$	\$12.00
$1\frac{7}{16}$	4.75	$3\frac{3}{16}$	13.50
$1\frac{11}{16}$	5.40	$3\frac{7}{16}$	16.50
$1\frac{15}{16}$	6.00	$3\frac{11}{16}$	19.00
$2\frac{3}{16}$	7.00	$3\frac{15}{16}$	23.00
$2\frac{7}{16}$	8.25	$4\frac{7}{16}$	30.00
$2\frac{11}{16}$	9.75	$4\frac{15}{16}$	40.00

Sole Plates



Standard Rigid Pillow Blocks

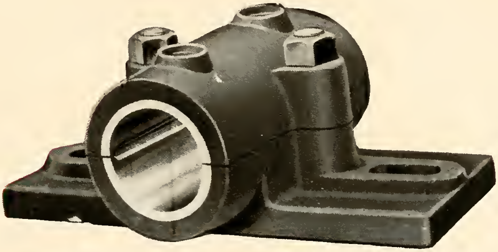
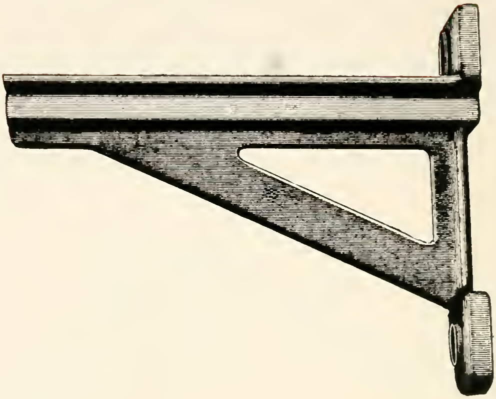


Fig. T-42

Shaft Sizes Inches	List Prices	Shaft Sizes Inches	List Prices
1 3/16	$1.60	2 7/16	$5.50
1 7/16	2.00	2 11/16	7.00
1 11/16	2.60	2 15/16	8.75
1 15/16	3.60	3 3/16	11.00
2 3/16	4.70		

PRICES ON APPLICATION

Wall Brackets



PRICES SUBJECT TO DISCOUNT

Diameter of Shaft Inches	Total length of bracket from wall Inches	Price	Diameter of Shaft Inches	Total length of bracket from wall Inches	Price
$1\frac{3}{16}$	18	$6.00	$1\frac{15}{16}$	24	$10.00
$1\frac{3}{16}$	24	7.00	$1\frac{15}{16}$	30	12.00
$1\frac{7}{16}$	18	7.00	$2\frac{3}{16}$	24	12.00
$1\frac{7}{16}$	24	8.00	$2\frac{3}{16}$	30	14.00
$1\frac{11}{16}$	24	8.00	$2\frac{7}{16}$	24	14.00
$1\frac{11}{16}$	30	10.00	$2\frac{7}{16}$	30	16.00

Seger Cones

The Seger cones were developed in Germany by Dr. Herman A. Seger in his life work of putting the clay industry in that country on a scientific basis. They are now made in this country by the following table of chemical formula and mixture. The analysis of his Zettlitz Kaolin and Rackonitz shale clay, which in nature we term in this country as plastic and flint clay, are as follows, and which he uses as his standard:

	Zettlitz Kaolin	Rackonitz Shale Clay
Silica	46.87	52.50
Alumina	38.56	45.22
Lime	trace	0.50
Iron Oxide	0.83	0.81
Magnesia	trace	0.54
Potash Soda	1.06	trace
Loss Ignition	12.73	0.78
	100.05	100.35

Mechanical analysis: Rackonitz shale clay.
99.27 per cent. clay substance.
0.73 per cent. sand.

The clay, therefore, consists of pure clay substances.

The melting point of cones is the ratio of alumina to silica and the amount of fluxes contained. We have, if anything, in this country purer clays in their natural state than abroad that will produce a higher cone than No. 36, the highest point reached in Germany.

Table of Official Melting Points of Seger Cones

Cone No.	Degrees Centigrade	Degrees Fahrenheit	Cone No.	Degrees Centigrade	Degrees Fahrenheit
010	950	1742	14	1410	2570
09	970	1778	15	1430	2606
08	990	1814	16	1450	2642
07	1010	1850	17	1470	2678
06	1030	1886	18	1490	2714
05	1050	1922	19	1510	2750
04	1070	1958	20	1530	2786
03	1090	1994	21	1550	2822
02	1110	2030	22	1570	2858
01	1130	2066	23	1590	2894
1	1150	2102	24	1610	2930
2	1170	2138	25	1630	2966
3	1190	2174	26	1650	3002
4	1210	2210	27	1670	3038
5	1230	2246	28	1690	3074
6	1250	2282	29	1710	3110
7	1270	2318	30	1730	3146
8	1290	2354	31	1750	3182
9	1310	2390	32	1770	3218
10	1330	2426	33	1790	3254
11	1350	2462	34	1810	3290
12	1370	2498	35	1830	3326
13	1390	2534	36	1850	3362

Seger Cones

Cone No.	Chemical Formula	Mixture	
1	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}\left\{\begin{matrix}0.2\ Fe_2O_3\\ 0.3\ Al_2O_3\end{matrix}\right\}4\ Si\ O_2$	Feldspar Marble Quartz Iron Oxide	83.55 35.00 66.00 16.00
2	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}\left\{\begin{matrix}0.1\ Fe_2O_3\\ 0.4\ Al_2O_3\end{matrix}\right\}4\ Si\ O_2$	Feldspar Marble Quartz Iron Oxide Zettlitz Kaolin	83.55 35.00 60.00 8.0 12.95
3	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}\left\{\begin{matrix}0.05\ Fe_2O_3\\ 0.45\ Al_2O_3\end{matrix}\right\}4\ Si\ O_2$	Feldspar Marble Quartz Iron Oxide Zettlitz Kaolin	83.55 35.00 57.00 4.00 19.43
4	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.5\ Al_2O_3,\ 4\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 54.00 25.90
5	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.5\ Al_2O_3,\ 5\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 84.00 25.90
6	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.6\ Al_2O_3,\ 6\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 108.0 35.85
7	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.7\ Al_2O_3,\ 7\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 132.0 51.80
8	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.8\ Al_2O_3,\ 8\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 156.00 64.75
9	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}0.9\ Al_2O_3,\ 9\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 180.00 77.70
10	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}1.0\ Al_2O_3,\ 10\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 204.00 90.65
11	$\left.\begin{matrix}0.3\ K_2O\\ 0.7\ Ca\ O\end{matrix}\right\}1.2\ Al_2O_3,\ 12\ Si\ O_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 252.00 116.55

Seger Cones—Continued

Cone No.	Chemical Formula	Mixture	
12	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}1.4\ Al_2O_3,\ 14\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 300.00 142.45
13	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}1.6\ Al_2O_3,\ 16\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 348.00 168.35
14	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}1.8\ Al_2O_3,\ 18\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 396.00 194.25
15	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}2.1\ Al_2O_3,\ 21\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.25 35.00 468.00 233.10
16	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}2.4\ Al_2O_3,\ 24\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 540.00 271.95
17	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}2.7\ Al_2O_3,\ 27\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 612.00 310.80
18	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}3.1\ Al_2O_3,\ 31\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 708.00 362.60
19	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}3.5\ Al_2O_3,\ 35\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 804.00 414.40
20	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}3.9\ Al_2O_3,\ 39\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 900.00 466.20
21	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}4.4\ Al_2O_3,\ 44\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.0 1020.0 530.95
22	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ Ca\ O\end{array}\right\}4.9\ Al_2O_3,\ 49\ SiO_2$	Feldspar Marble Quartz Zettlitz Kaolin	83.55 35.00 1140.0 595.70

Seger Cones—Continued

Cone No.	Chemical Formula	Mixture
23	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ CaO\end{array}\right\}5.4\ Al_2O_3,\ 54\ SiO_2$	Feldspar.......... 83.55 Marble........... 35.00 Quartz...........1260.0 Zettlitz Kaolin.....660.45
24	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ CaO\end{array}\right\}6.0\ Al_2O_3,\ 60\ SiO_2$	Feldspar.......... 83.55 Marble........... 35.00 Quartz...........1404.00 Zettlitz Kaolin.....738.15
25	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ CaO\end{array}\right\}6.6\ Al_2O_3,\ 66\ SiO_2$	Feldspar.......... 83.55 Marble........... 35.00 Quartz...........1548.0 Zettlitz Kaolin.....815.85
26	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ CaO\end{array}\right\}7.2\ Al_2O_3,\ 72\ SiO_2$	Feldspar.......... 83.55 Marble........... 35.00 Quartz...........1692.00 Zettlitz Kaolin.....893.55
27	$\left.\begin{array}{l}0.3\ K_2O\\0.7\ CaO\end{array}\right\}20\ Al_2O_3,\ 200\ SiO_2$	Feldspar.......... 83.55 Marble........... 35.00 Quartz...........4764.0 Zettlitz Kaolin....2551.13
28	$Al_2O_3,\ 10\ SiO_2$	Quartz............ 240.0 Zettlitz Kaolin..... 129.5
29	$Al_2O_3,\ 8\ SiO_2$	Quartz............180.0 Zettlitz Kaolin.....129.5
30	$Al_2O_3,\ 6\ SiO_2$	Quartz............120.0 Zettlitz Kaolin.....129.5
31	$Al_2O_3,\ 5\ SiO_2$	Quartz............ 90.0 Zettlitz Kaolin.....129.5
32	$Al_2O_3,\ 4\ SiO_2$	Quartz............ 60.0 Zettlitz Kaolin.....129.5
33	$Al_2O_3,\ 3\ SiO_2$	Quartz............ 30.0 Zettlitz Kaolin.....129.5
34	$Al_2O_3,\ 2.5\ SiO_2$	Quartz............ 15.0 Zettlitz Kaolin.....129.5
35	$Al_2O_3,\ 2\ SiO_2$	Zettlitz Kaolin.....
36		Rackonitz Shale Clay

The melting of these tetrahedrous determines the temperatures between the melting point of 90 gold, 10 platinum (that is about 1145 degrees) and the highest heat of the porcelain fire. The temperatures which correspond to the melting points of the cones 21 to 26 are reached in the iron and steel industries. The cones 26 to 36 serve for the determination of the refractoriness of clays.

Temperatures

Table of Melting Points

To convert Fahrenheit degrees to Centigrade, subtract 32 degrees and multiply by $\frac{5}{9}$.

To convert Centigrade degrees to Fahrenheit, multiply by $\frac{9}{5}$ and add 32 degrees.

Tallow	92 degrees F.
Spermaceti	120 degrees F.
White Wax	154 degrees F.
Sulphur	239 degrees F.
Tin	455 degrees F.
Bismuth	518 degrees F.
Lead	630 degrees F.
Zinc	793 degrees F.
Antimony	810 degrees F.
Silver (pure)	1830 degrees F.
Copper	2050 degrees F.
Gold (coin)	2156 degrees F.
Cast iron	2000 degrees F. to 2200 degrees F.
Steel	2350 degrees F. to 2550 degrees F.
Wrought iron	2700 degrees F. to 2900 degrees F.

The appearance of a fire affords a good indication of the temperature of a furnace.

(A little practice reduces the error of high temperatures to within 100 degrees Fahrenheit.)

Red, just visible	977 degrees F.	525 degrees C.
Red, dull	1290 degrees F.	700 degrees C.
Red, dull cherry	1472 degrees F.	800 degrees C.
Red, full	1657 degrees F.	900 degrees C.
Red, clear	1832 degrees F.	1000 degrees C.
Orange, deep	2012 degrees F.	1100 degrees C.
Orange, clear	2192 degrees F.	1200 degrees C.
White	2272 degrees F.	1300 degrees C.
White, bright	2552 degrees F.	1400 degrees C.
White, dazzling	2732 degrees F.	1500 degrees C.
	2912 degrees F.	1600 degrees C.

Above tables give the colors of iron caused by heat. (Pouillet.)

Useful Information

Linear Expansion of Substances by Heat

To find the increase in the length of a bar of any material due to an increase of temperature, multiply the number of degrees of increase of temperature by the coefficient for 100 degrees and by the length of the bar, and divide by 100.

NAME OF SUBSTANCE	Coef. for 100° Fahr.	Coef. for 180° Fahr. or 100°C
Baywood (in the direction of the grain, dry)	.00026 to .00031	.00046 to .00057
Brass (cast)	.00104	.00188
Brass (wire)	.00107	.00193
Brick (fire)	.0003	.0005
Cement (Roman)	.0008	.0014
Copper	.0009	.0017
Deal (in the direction of the grain, dry)	.00024	.00044
Glass (English flint)	.00045	.00081
Glass (French white lead)	.00048	.00087
Gold	.0008	.0015
Granite (average)	.00047	.00085
Iron (cast)	.0006	.0011
Iron (soft, forged)	.0007	.0012
Iron (wire)	.0008	.0014
Lead	.0016	.0029
Marble (carrara)	.00036 to .0006	.00065 to .0011
Mercury	.0033	.0060
Platinum	.0005	.0009
Sandstone	.0005 to .0007	.0009 to .0012
Silver	.0011	.002
Slate (Wales)	.0006	.001
Water (varies considerably with the temperature)	.0086	.0155

For Reference

Diameter multiplied by 3.1416 = circumference.

Circumference multiplied by .3183 = diameter.

Radius multiplied by 6.2831 = circumference.

Square of the diameter multiplied by .7854 = area.

Diameter multiplied by .8862 = side of equal square.

Area of a rectangle = length multiplied by breadth.

Doubling the diameter of a circle increases its area four times.

Size of a square multiplied by 1.128 = diameter of circle of equal area.

Surface of a sphere = square of diameter multiplied by 3.1416.

Area of a triangle = base multiplied by one-half the altitude.

Area of a sector of a circle = one-half the length of the arc multiplied by the radius of the circle.

One cubic foot of water weighs 62½ pounds and contains 7½ gallons.

One gallon of water (U. S. Standard) weighs 8⅓ pounds.

To find the capacity (U. S. gallons) of cylindrical tanks, square the diameter expressed in inches, multiply by the length and by .0034.

Boiler horse power: The evaporation of 30 pounds of water per hour from a temperature of 100 degrees F. into steam at 70 pounds gauge pressure.

One pound of water evaporated from and at 212 degrees is equivalent to 965.7 British thermal units.

To find the number of square feet of heating surface in tubes: Multiply the number of tubes by the diameter of a tube in inches, by its length in feet, and by .2618.

How to Figure Radiation

A good rule for estimating radiation is as follows:

For water: 1 square foot of radiation to every square foot of glass; 1 square foot of radiation to every 10 square feet of wall; 1 square foot of radiation to every 150 cubic feet of the contents of the room.

The foregoing rule refers to rooms with one exposure. In rooms with two exposures the ratio of cubical contents should be 1 to 100. For steam, take two-thirds of the above results for radiation.

It is best for a water and steam job to figure out the work as if it were to be for water, using the above water rule, and then for steam, take two-thirds of that result.

Allow one-third more radiation when determining the heating surface or size of boiler.

Rule for Calculating Length of Belting Before Pulleys are Placed in Position

Add together the diameters of two pulleys, and multiply the sum by 3.14159. To half the result thus obtained add twice the distance from center of one pulley (or shaft) to center of the other pulley (or shaft).

Example—Given the distance between center of pulleys, 28 feet, 8 inches; diameter of pulleys, 52 inches and 46 inches. What is length of belt?

$52+46=98\times 3.14159=307.87$ inches.

$307.87\div 2=153.08$ inches $\cdot\ 12=12.83$ feet.

centers, $28\frac{1}{12}$ feet $\times 2=$ 57.33 feet.

Answer, $70\frac{1}{12}$ feet.

Rules for Calculating Speed of Pulleys

Problem I.—The diameter of the driver and driven being given, to find the number of revolutions of the driven:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions.

Problem II.—The diameter and the revolutions of the driver being given to find the diameter of the driven, that shall make any given number of revolutions in the same time:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

Problem III.—To ascertain the size of the driver:

Rule.—Multiply the diameter of the driven by the number of revolutions you wish to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.

The above rules are practically correct. Though owing to slip, elasticity, and thickness of the belt, the circumference of the driven seldom runs as fast as the driver.

Belts, like gears, have a pitch line, or a circumference of uniform motion. This circumference is within the thickness of the belt, and must be considered if pulleys differ greatly in diameter and a required speed is absolutely necessary.

Metric System

Measures of Weight

(Unit Gramme)

	GRAINS	OZ. TROY	LB. AVOR.	CWT.
Centigramme	0.15432	.....	.....	.....
Decigramme	1.54323	0.003	.....	.....
Gramme	15.43235	0.032	0.002	.....
Decagramme	154.32349	0.321	0.022	.....
Hectogramme	1543.23488	3.215	0.220	0.001
Kilogramme	15432.34880	32.150	2.204	0.019

Measures of Length

(Unit Metre)

	INCHES	FEET	YARD	MILE
Millimetre	0.03937	0.003	0.001	.....
Centimetre	0.39371	0.032	0.010	.....
Decimetre	3.93708	0.328	0.109	.....
Metre	39.37079	3.280	1.093	.....
Decametre	393.70790	32.808	10.936	0.006
Hectometre	3937.07900	328.089	109.363	0.062
Kilometre	39370.79000	3280.899	1093.633	0.621

Convenient Multiples for Conversion

To Convert		
Grains to Grammes	Multiply by	.065
Ounces to Grammes	"	28.35
Pounds to Grammes	"	453.6
Pounds to Kilogrammes	"	.45
Cwts. to Kilogrammes	"	50.8
Tons to Kilogrammes	"	1016.
Grammes to Grains	"	15.4
Grammes to Ounces	"	0.35
Kilogrammes to Ounces	"	35.3
Kilogrammes to Pounds	"	2.2
Kilogrammes to Cwts	"	.02
Kilogrammes to Tons	"	.001
Inches to Millimetres	"	25.4
Inches to Centimetres	"	2.54
Feet to Metres	"	.3048
Yards to Metres	"	.9144
Yards to Kilometres	"	.0009
Miles to Kilometres	"	1.6
Millimetres to Inches	"	.04
Centimetres to Inches	"	.4
Metres to Feet	"	3.3
Metres to Yards	"	1.1
Kilometres to Yards	"	1093.6
Kilometres to Miles	"	.62

1 Yard=0.9144 metre. 1 Sq. Metre=1.196 sq. yard. 1 Litre=1.760 pints or 0.22 gals.

Weights and Measures

TROY WEIGHT

24 grains = 1 pwt. 20 pwt. = 1 ounce. 12 ounces = 1 pound.
Used for weighing gold, silver and jewels.

APOTHECARIES' WEIGHT

20 grains = 1 scruple. 8 drams = 1 ounce.
3 scruples = 1 dram. 12 ounces = 1 pound.
The ounce and pound in this are the same as in Troy weight.

AVOIRDUPOIS WEIGHT

$28\frac{11}{32}$ grains = 1 dram. 16 drams = 1 ounce. 16 ounces = 1 pound.
24 pounds = 1 quarter. 4 quarters = 1 cwt.
2,080 pounds = 1 short ton. 2,240 pounds = 1 long ton.

DRY MEASURE

2 pints = 1 quart. 4 pecks = 1 bushel.
8 quarts = 1 peck. 36 bushels = 1 chaldron.

LIQUID MEASURE

4 gills = 1 pint. 2 pints = 1 quart. 4 quarts = 1 gallon.
31½ gallons = 1 barrel. 2 barrels = 1 hogshead.

LONG MEASURE

12 inches = 1 foot. 3 feet = 1 yard. 5½ yards = 1 rod.
40 rods = 1 furlong. 8 furlongs = 1 sta. mile. 3 miles = 1 league.

MARINERS' MEASURE

6 feet = 1 fathom. 5,280 feet = 1 statute mile.
120 fathoms = 1 cable length. 6,085 feet = 1 nautical mile.
7½ cable lengths = 1 mile.

MISCELLANEOUS

3 inches = 1 palm. 4 inches = 1 hand. 6 inches = 1 span.
48 inches = 1 cubit. 21.8 in. = 1 Bible cubit. 2½ feet = 1 military pace.

SQUARE MEASURE

144 square inches = 1 square foot. 40 square rods = 1 rood.
9 square feet = 1 square yard. 4 roods = 1 acre.
30¼ square yards = 1 square rod. 640 acres = 1 square mile.

SURVEYORS' MEASURE

7.92 inches = 1 link. 640 acres = 1 sq. mile.
25 links = 1 rod. 36 sq. miles (6 miles sq.) = 1 township.
10 sq. chains or 160 sq. rods = 1 acre. 4 rods = 1 chain.

CUBIC MEASURE

1,728 cubic in. = 1 cubic foot. 268.8 cubic in. = 1 standard gallon.
27 cubic feet = 1 cubic yard. 128 cubic feet = 1 cord (wood).
2,150.42 cubic in. = 1 standard bushel. 40 cubic feet = 1 ton (shipping).
1 cubic foot = about four-fifths of a bushel.

Weight of Round and Square Steel Per Lineal Foot

Size in Inches	Round	Square	Size in Inches	Round	Square	Size in Inches	Round	Square
1/32	.0026	.0033	2	10.68	13.60	4	42.73	54.40
1/16	.0104	.0133	2 1/16	11.36	14.46	4 1/16	44.07	56.11
1/8	.0417	.0531	2 1/8	12.06	15.35	4 1/8	45.44	57.85
3/16	.0938	.1195	2 3/16	12.78	16.27	4 3/16	46.83	59.62
1/4	.1669	.2123	2 1/4	13.52	17.22	4 1/4	48.24	61.41
5/16	.2608	.3333	2 5/16	14.28	18.19	4 5/16	49.66	63.23
3/8	.3756	.4782	2 3/8	15.07	19.18	4 3/8	51.11	65.08
7/16	.5111	.6508	2 7/16	15.86	20.20	4 7/16	52.58	66.95
1/2	.6676	.8500	2 1/2	16.69	21.25	4 1/2	54.07	68.85
9/16	.8449	1.076	2 9/16	17.53	22.23	4 9/16	55.59	70.78
5/8	1.043	1.328	2 5/8	18.40	23.43	4 5/8	57.12	72.73
11/16	1.262	1.608	2 11/16	19.29	24.56	4 11/16	58.67	74.70
3/4	1.502	1.913	2 3/4	20.20	25.00	4 3/4	60.25	76.71
13/16	1.763	2.245	2 13/16	21.12	26.90	4 13/16	61.84	78.74
7/8	2.044	2.603	2 7/8	22.07	28.10	4 7/8	63.46	80.81
15/16	2.347	2.989	2 15/16	23.04	29.34	4 15/16	65.10	82.89
1	2.670	3.400	3	24.03	30.60	5	66.76	85.00
1 1/16	3.014	3.838	3 1/16	25.04	31.89	5 1/16	68.44	87.14
1 1/8	3.379	4.303	3 1/8	26.08	33.20	5 1/8	70.14	89.30
1 3/16	3.766	4.795	3 3/16	27.13	34.55	5 3/16	71.86	91.49
1 1/4	4.173	5.312	3 1/4	28.20	35.92	5 1/4	73.60	93.72
1 5/16	4.600	5.857	3 5/16	29.30	37.31	5 5/16	75.37	95.96
1 3/8	5.019	6.428	3 3/8	30.42	38.73	5 3/8	77.15	98.23
1 7/16	5.518	7.026	3 7/16	31.56	40.18	5 7/16	78.95	100.5
1 1/2	6.008	7.650	3 1/2	32.71	41.65	5 1/2	80.77	102.8
1 9/16	6.520	8.301	3 9/16	33.90	43.14	5 9/16	82.62	105.2
1 5/8	7.051	8.978	3 5/8	35.09	44.68	5 5/8	84.49	107.6
1 11/16	7.604	9.682	3 11/16	36.31	46.24	5 11/16	86.38	110.0
1 3/4	8.178	10.41	3 3/4	37.56	47.82	5 3/4	88.29	112.4
1 13/16	8.773	11.17	3 13/16	38.81	49.42	5 13/16	90.22	114.9
1 7/8	9.388	11.95	3 7/8	40.10	51.05	5 7/8	92.17	117.4
1 15/16	10.02	12.76	3 15/16	41.40	52.71	5 15/16	94.14	119.9

These figures represent the theoretical weights of steel. Iron will run about 2 per cent. lighter.

Weight of Round and Square Steel Per Lineal Foot

Size in Inches	Round	Square	Size in Inches	Round	Square	Size in Inches	Round	Square
6	96.14	122.4	**8**	171.0	217.6	**10**	267.0	340.0
6 1/16	98.14	125.0	**8 1/16**	173.6	221.0	**10 1/16**	270.4	344.3
6 1/8	100.2	127.6	**8 1/8**	176.3	224.5	**10 1/8**	273.8	348.5
6 3/16	102.2	130.2	**8 3/16**	179.0	228.0	**10 3/16**	277.1	352.9
6 1/4	104.3	132.8	**8 1/4**	181.8	231.4	**10 1/4**	280.6	357.2
6 5/16	106.4	135.5	**8 5/16**	184.5	234.9	**10 5/16**	284.0	361.6
6 3/8	108.5	138.2	**8 3/8**	187.3	238.5	**10 3/8**	287.4	366.0
6 7/16	110.7	140.9	**8 7/16**	190.1	242.0	**10 7/16**	290.9	370.4
6 1/2	112.8	143.6	**8 1/2**	193.0	245.6	**10 1/2**	294.4	374.9
6 9/16	114.9	146.5	**8 9/16**	195.7	249.3	**10 9/16**	297.9	379.4
6 5/8	117.2	149.2	**8 5/8**	198.7	252.9	**10 5/8**	301.4	383.8
6 11/16	119.4	152.1	**8 11/16**	201.6	256.6	**10 11/16**	305.0	388.3
6 3/4	121.7	154.9	**8 3/4**	204.4	260.3	**10 3/4**	308.6	392.9
6 13/16	123.9	157.8	**8 13/16**	207.4	264.1	**10 13/16**	312.2	397.5
6 7/8	126.2	160.8	**8 7/8**	210.3	267.9	**10 7/8**	315.8	402.1
6 15/16	128.5	163.6	**8 15/16**	213.3	271.6	**10 15/16**	319.5	406.8
7	130.9	166.6	**9**	216.3	275.4	**11**	323.1	411.4
7 1/16	133.2	169.6	**9 1/16**	219.3	279.3	**11 1/16**	326.8	416.1
7 1/8	135.6	172.6	**9 1/8**	222.4	283.2	**11 1/8**	330.5	420.9
7 3/16	137.9	175.6	**9 3/16**	225.4	287.0	**11 3/16**	334.3	425.5
7 1/4	140.4	178.7	**9 1/4**	228.5	290.9	**11 1/4**	337.9	430.3
7 5/16	142.8	181.8	**9 5/16**	231.5	294.9	**11 5/16**	341.7	435.1
7 3/8	145.3	184.9	**9 3/8**	234.7	298.9	**11 3/8**	345.5	439.9
7 7/16	147.7	188.1	**9 7/16**	237.9	302.8	**11 7/16**	349.4	444.8
7 1/2	150.2	191.3	**9 1/2**	241.0	306.8	**11 1/2**	353.1	449.6
7 9/16	152.7	194.4	**9 9/16**	244.2	310.9	**11 9/16**	357.0	454.5
7 5/8	155.2	197.7	**9 5/8**	247.4	315.0	**11 5/8**	360.9	459.5
7 11/16	157.8	200.9	**9 11/16**	250.6	319.1	**11 11/16**	364.8	464.4
7 3/4	160.3	204.2	**9 3/4**	253.9	323.2	**11 3/4**	368.6	469.4
7 13/16	163.0	207.6	**9 13/16**	257.1	327.4	**11 13/16**	372.6	474.4
7 7/8	165.6	210.8	**9 7/8**	260.4	331.6	**11 7/8**	376.6	479.5
7 15/16	168.2	214.2	**9 15/16**	263.7	335.8	**11 15/16**	380.6	484.5

These figures represent the theoretical weights of steel. Iron will run about 2 per cent. lighter.

*Weight of Flat Rolled Steel, Per Lineal Foot

Thickness Inches	WIDTH—INCHES																					
	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5
1/16	.1060	.1381	.1594	.1859	.212	.2391	.2656	.292	.319	.346	.372	.425	.478	.531	.584	.638	.691	.744	.80	.85	.90	.96	1.01	1.06
1/8	.2125	.2656	.3188	.3720	.4250	.4782	.5312	.585	.638	.692	.744	.850	.96	1.06	1.17	1.28	1.38	1.49	1.59	1.70	1.81	1.91	2.02	2.13
3/16	.319	.399	.478	.558	.638	.717	.797	.875	.957	1.04	1.15	1.28	1.44	1.59	1.75	.191	2.07	2.23	2.39	2.55	2.71	2.87	3.03	3.19
1/4	.425	.531	.636	.743	.805	.957	1.06	1.17	1.28	1.38	1.49	1.70	1.92	2.12	2.34	2.55	2.76	2.98	3.19	3.40	3.61	3.83	4.04	4.25
5/16	.531	.664	.797	.929	1.06	1.20	1.33	1.46	1.59	1.73	1.86	2.12	2.39	2.65	2.92	3.19	3.45	3.72	3.99	4.25	4.52	4.78	5.05	5.31
3/8	.638	.797	.957	1.116	1.28	1.43	1.59	1.76	1.92	2.08	2.23	2.55	2.87	3.19	3.51	3.83	4.15	4.47	4.78	5.10	5.42	5.74	6.06	6.38
7/16	.744	.929	1.116	1.302	1.49	1.68	1.86	2.05	2.23	2.42	2.60	2.98	3.35	3.72	4.09	4.46	4.83	5.20	5.58	5.95	6.32	6.70	7.07	7.44
1/2	.850	1.06	1.275	1.487	1.70	1.92	2.12	2.34	2.55	2.72	2.98	3.40	3.83	4.25	4.67	5.10	5.53	5.95	6.38	6.80	7.22	7.65	8.08	8.50
9/16	.957	1.20	1.434	1.674	1.92	2.15	2.39	2.63	2.87	3.11	3.35	3.83	4.30	4.78	5.26	5.74	6.22	6.70	7.17	7.65	8.13	8.61	9.09	9.57
5/8	1.06	1.33	1.594	1.859	2.12	2.39	2.65	2.92	3.19	3.46	3.72	4.25	4.78	5.31	5.84	6.38	6.91	7.44	7.97	8.50	9.03	9.57	10.10	10.63
11/16	1.17	1.46	1.753	2.045	2.34	2.63	2.92	3.22	3.51	3.80	4.09	4.67	5.26	5.84	6.43	7.02	7.60	8.18	8.76	9.35	9.93	10.52	11.11	11.69
3/4	1.28	1.60	1.913	2.232	2.55	2.87	3.19	3.51	3.83	4.15	4.47	5.10	5.75	6.38	7.02	7.65	8.29	8.93	9.57	10.20	10.84	11.48	12.12	12.75
13/16	1.38	1.73	2.072	2.417	2.76	3.11	3.45	3.80	4.14	4.49	4.84	5.53	6.21	6.90	7.60	8.29	8.98	9.67	10.36	11.05	11.74	12.43	13.12	13.81
7/8	1.49	1.86	2.232	2.604	2.98	3.35	3.72	4.09	4.47	4.84	5.20	5.95	6.69	7.44	8.18	8.93	9.67	10.41	11.16	11.90	12.65	13.39	14.13	14.87
15/16	1.60	1.99	2.391	2.789	3.19	3.59	3.99	4.39	4.78	5.18	5.58	6.38	7.18	7.97	8.77	9.57	10.36	11.16	11.95	12.75	13.55	14.34	15.14	15.94
1	1.70	2.13	2.55	2.98	3.40	3.83	4.25	4.68	5.10	5.53	5.95	6.80	7.65	8.50	9.35	10.20	11.05	11.90	12.75	13.60	14.45	15.30	16.15	17.00
1 1/16	1.81	2.26	2.710	3.161	3.61	4.064	4.52	4.97	5.42	5.87	6.32	7.22	8.13	9.03	9.93	10.84	11.74	12.65	13.55	14.45	15.35	16.26	17.16	18.00
1 1/8	1.91	2.39	2.868	3.347	3.83	4.304	4.78	5.26	5.74	6.22	6.70	7.65	8.61	9.57	10.52	11.48	12.43	13.39	14.34	15.30	16.26	17.22	18.17	19.13
1 3/16	2.02	2.52	3.03	3.533	4.04	4.54	5.05	5.56	6.06	6.56	7.07	8.08	9.09	10.10	11.11	12.12	13.12	14.13	15.14	16.15	17.16	18.17	19.18	20.19
1 1/4	2.12	2.66	3.19	3.72	4.25	4.79	5.31	5.85	6.38	6.91	7.44	8.50	9.57	10.63	11.69	12.75	13.81	14.87	15.94	17.00	18.06	19.13	20.19	21.25
1 5/16	2.23	2.79	3.35	3.91	4.46	5.02	5.58	6.14	6.69	7.25	7.81	8.93	10.04	11.16	12.27	13.39	14.50	15.62	16.74	17.85	18.96	20.08	21.20	22.32
1 3/8	2.34	2.92	3.51	4.09	4.67	5.26	5.84	6.43	7.02	7.60	8.18	9.35	10.52	11.69	12.85	14.03	15.20	16.36	17.53	18.70	19.87	21.04	22.21	23.38
1 7/16	2.45	3.06	3.67	4.28	4.89	5.50	6.11	6.72	7.34	7.94	8.56	9.78	11.00	12.22	13.44	14.66	15.88	17.10	18.33	19.55	20.77	21.99	23.22	24.44
1 1/2	2.55	3.19	3.83	4.47	5.10	5.74	6.38	7.02	7.65	8.29	8.93	10.20	11.48	12.75	14.03	15.30	16.58	17.85	19.13	20.40	21.68	22.95	24.23	25.50
1 9/16	2.66	3.32	3.99	4.65	5.32	5.98	6.64	7.31	7.97	8.74	9.30	10.63	11.95	13.28	14.61	15.94	17.27	18.60	19.92	21.25	22.58	23.91	25.24	26.57
1 5/8	2.76	3.45	4.15	4.84	5.52	6.22	6.90	7.60	8.29	8.98	9.67	11.05	12.43	13.81	15.19	16.58	17.96	19.34	20.72	22.10	23.48	24.87	26.25	27.63
1 11/16	2.87	3.59	4.31	5.02	5.74	6.46	7.17	7.89	8.61	9.33	10.04	11.47	12.91	14.34	15.78	17.22	18.65	20.08	21.51	22.95	24.38	25.82	27.26	28.69
1 3/4	2.98	3.72	4.47	5.21	5.95	6.70	7.44	8.19	8.93	9.57	10.42	11.90	13.40	14.88	16.37	17.85	19.34	20.83	22.32	23.80	25.29	26.78	28.27	29.75
1 13/16	3.08	3.85	4.62	5.46	6.16	6.93	7.70	8.48	9.24	10.02	10.79	12.33	13.86	15.40	16.95	18.49	20.03	21.57	23.11	24.65	26.19	27.73	29.27	30.81
1 7/8	3.19	3.99	4.79	5.58	6.38	7.17	7.97	8.77	9.57	10.36	11.15	12.75	14.34	15.94	17.53	19.13	20.72	22.31	23.91	25.50	27.10	28.69	30.28	31.87
1 15/16	3.30	4.12	4.94	5.77	6.59	7.42	8.24	9.06	9.88	10.71	11.53	13.18	14.83	16.47	18.12	19.77	21.41	23.06	24.70	26.35	28.00	29.64	31.29	32.94
2	3.40	4.25	5.10	5.95	6.80	7.65	8.50	9.35	10.20	11.05	11.90	13.60	15.30	17.00	17.80	20.40	22.10	23.80	25.50	27.20	28.90	30.60	32.30	34.00

*These figures are the theoretical weights, based on 489.6 lbs. per cubic foot of steeel. Iron will run about 2 per cent. lighter.

*Weight of Flat Rolled Steel, Per Lineal Foot—Continued

Thickness Inches	WIDTH—INCHES																							
	5¼	5½	5¾	6	6¼	6½	6¾	7	7¼	7½	7¾	8	8¼	8½	8¾	9	9¼	9½	9¾	10	10¼	10½	10¾	11
1/16.....	1.116	1.691	1.222	1.275	1.328	1.381	1.434	1.487	1.540	1.594	1.647	1.70	1.753	1.806	18.59	1.913	1.965	2.019	2.078	2.135	2.178	2.322	2.235	2.338
⅛.....	2.232	2.338	2.444	2.550	2.656	2.762	2.869	2.975	3.081	3.188	3.294	3.40	3.506	3.612	3.720	3.826	3.913	4.037	4.144	4.250	4.356	4.463	4.569	4.676
3/16.....	3.35	3.51	3.67	3.83	3.99	4.14	4.30	4.46	4.62	4.78	4.94	5.10	5.26	5.42	5.58	5.74	5.90	6.06	6.22	6.38	6.54	6.70	6.86	7.02
¼.....	4.46	4.67	4.89	5.10	5.31	5.53	5.74	5.95	6.16	6.36	6.58	6.80	7.01	7.22	7.43	7.65	7.86	8.08	8.29	8.50	8.71	8.92	9.14	9.34
5/16.....	5.58	5.84	6.11	6.38	6.64	6.90	7.17	7.44	7.70	7.97	8.23	8.50	8.76	9.03	9.29	9.56	9.83	10.10	10.36	10.62	10.89	11.16	11.42	11.68
⅜.....	6.69	7.02	7.34	7.65	7.97	8.29	8.61	8.93	9.25	9.57	9.88	10.20	10.52	10.84	11.16	11.48	11.80	12.12	12.44	12.75	13.07	13.39	13.71	14.03
7/16.....	7.81	8.18	8.56	8.93	9.29	9.67	10.04	10.41	10.78	11.16	11.53	11.90	12.27	12.64	13.02	13.40	13.76	14.14	14.51	14.88	15.25	15.62	15.99	16.36
½.....	8.93	9.35	9.77	10.20	10.63	11.05	11.48	11.90	12.32	12.75	13.18	13.60	13.03	14.44	14.87	15.30	15.73	16.16	16.58	17.00	17.42	17.85	18.28	18.70
9/16.....	10.04	10.52	11.00	11.48	11.95	12.43	12.91	13.39	13.86	14.34	14.82	15.30	15.78	16.26	16.74	17.22	17.69	18.18	18.65	19.14	19.61	20.08	20.56	21.02
⅝.....	11.16	11.69	12.22	12.75	13.28	13.81	14.34	14.87	15.40	15.94	16.47	17.00	17.53	18.06	18.59	19.13	19.65	20.19	20.72	21.35	21.78	22.32	22.85	23.38
11/16.....	12.27	12.85	13.44	14.03	14.61	15.20	15.78	16.36	16.94	17.53	18.12	18.70	19.28	19.86	20.45	21.04	21.62	22.21	22.79	23.38	23.96	24.54	25.13	25.70
¾.....	13.39	14.03	14.67	15.30	15.94	16.58	17.22	17.85	18.49	19.13	19.77	20.40	21.04	21.68	22.32	22.96	23.59	24.23	24.86	25.50	26.14	26.78	27.42	28.05
13/16.....	14.50	15.19	15.88	16.58	17.27	17.95	18.65	19.34	20.03	20.72	21.41	22.10	22.79	23.48	24.17	24.86	25.55	26.24	26.94	27.62	28.32	29.00	29.69	30.40
⅞.....	15.62	16.36	17.10	17.85	18.60	19.34	20.08	20.83	21.57	22.32	23.05	23.80	24.55	25.30	26.04	26.78	27.52	28.26	29.01	29.75	30.50	31.34	31.98	32.72
15/16.....	16.74	17.53	18.33	19.13	19.92	20.72	21.51	22.32	23.11	23.91	24.70	25.50	26.30	27.10	27.89	28.69	29.49	30.28	31.08	31.88	32.67	33.48	34.28	35.06
1	17.85	18.70	19.55	20.40	21.25	22.10	22.95	23.80	24.65	25.50	26.35	27.20	28.05	28.90	29.75	30.60	31.45	32.20	33.15	34.00	34.85	35.70	36.55	37.40
1 1/16.....	18.96	19.87	20.77	21.68	22.58	23.48	24.39	25.29	26.19	27.10	28.00	28.90	29.80	30.70	31.61	32.52	33.41	34.32	35.22	36.12	37.03	37.92	38.83	39.74
1⅛.....	20.08	21.04	21.99	22.95	23.91	24.87	25.82	26.78	27.73	28.68	29.64	30.60	31.56	32.52	33.47	34.43	35.38	36.34	37.29	38.25	39.21	40.17	41.12	42.08
1 3/16.....	21.20	22.21	23.22	24.23	25.23	26.24	27.25	28.26	29.27	30.28	31.29	32.30	33.31	34.32	35.33	36.34	37.35	38.36	39.37	40.38	41.39	42.40	43.40	44.42
1¼.....	22.32	23.38	24.44	25.50	26.56	27.62	28.69	29.75	30.81	31.88	32.94	34.00	35.06	36.12	37.20	38.26	39.31	40.37	41.47	42.50	43.56	44.63	45.69	46.76
1 5/16.....	23.43	24.54	25.66	26.78	27.90	29.01	30.12	31.22	32.35	33.48	34.59	35.70	36.81	37.93	39.05	40.16	41.28	42.40	43.52	44.64	45.75	46.86	47.97	49.08
1⅜.....	24.54	25.71	26.88	28.05	29.22	30.39	21.56	32.72	33.89	35.06	36.23	37.40	38.57	39.74	40.91	42.08	43.25	44.41	45.58	46.75	47.92	49.08	50.25	51.42
1 7/16.....	25.66	26.88	28.10	29.33	30.55	51.77	32.90	34.21	35.44	36.66	37.88	39.10	40.32	41.54	42.77	44.00	45.22	46.44	47.66	48.88	50.10	51.32	52.54	53.76
1½.....	26.78	28.05	29.33	30.60	31.88	33.15	34.43	35.70	36.98	38.26	39.53	40.80	42.08	43.35	44.63	45.90	47.18	48.45	49.73	51.00	52.28	53.55	54.83	56.10
1 9/16.....	27.89	29.22	30.55	31.88	33.20	34.53	35.86	37.19	38.51	39.84	41.17	42.50	43.83	45.16	46.49	47.82	49.14	50.48	51.80	53.14	54.46	55.78	57.11	58.42
1⅝.....	29.01	30.39	31.77	33.15	34.53	35.91	37.99	38.67	40.05	41.44	42.82	44.20	45.58	46.96	48.34	49.73	51.10	52.49	53.87	55.25	56.63	58.02	59.40	60.78
1 11/16.....	30.12	31.55	32.99	34.43	35.86	37.30	38.73	40.16	41.59	43.03	44.47	45.90	47.33	48.76	50.20	51.64	53.07	54.51	55.94	57.37	58.81	60.24	61.68	63.10
1¾.....	31.24	32.73	34.22	35.70	37.19	38.68	40.17	41.65	43.14	44.63	46.12	47.60	49.09	50.58	52.07	53.56	55.04	56.53	58.01	59.50	60.99	62.48	63.97	65.45
1 13/16.....	32.35	33.89	35.43	36.98	38.52	40.05	41.60	43.14	44.68	46.22	47.76	49.30	50.84	52.38	53.92	55.46	57.00	58.54	60.09	61.62	63.17	64.70	66.24	67.80
1⅞.....	33.47	35.06	36.65	38.25	38.85	41.44	43.03	44.63	46.22	47.82	49.40	51.00	52.60	54.20	55.79	57.38	58.97	60.56	62.16	63.75	65.35	66.94	68.53	60.12
1 15/16.....	34.50	36.23	37.88	39.53	41.17	42.82	44.46	46.12	47.76	49.41	51.05	52.70	54.35	56.00	57.64	59.29	60.94	62.58	64.23	65.88	67.52	69.18	70.83	72.46
2	35.70	37.40	39.10	40.80	42.50	44.20	45.90	47.60	49.30	51.00	52.70	54.40	56.10	57.80	59.50	61.20	62.90	64.60	66.30	68.00	69.70	71.40	73.10	74.80

*These figures are the theoretical weights, based on 489.6 lbs. per cubic foot of steel. Iron will run about 2 per cent. lighter.

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